Tracks rebuilt with ICC-approved loan

p. 29

Railway TRACK and STRUCTURES

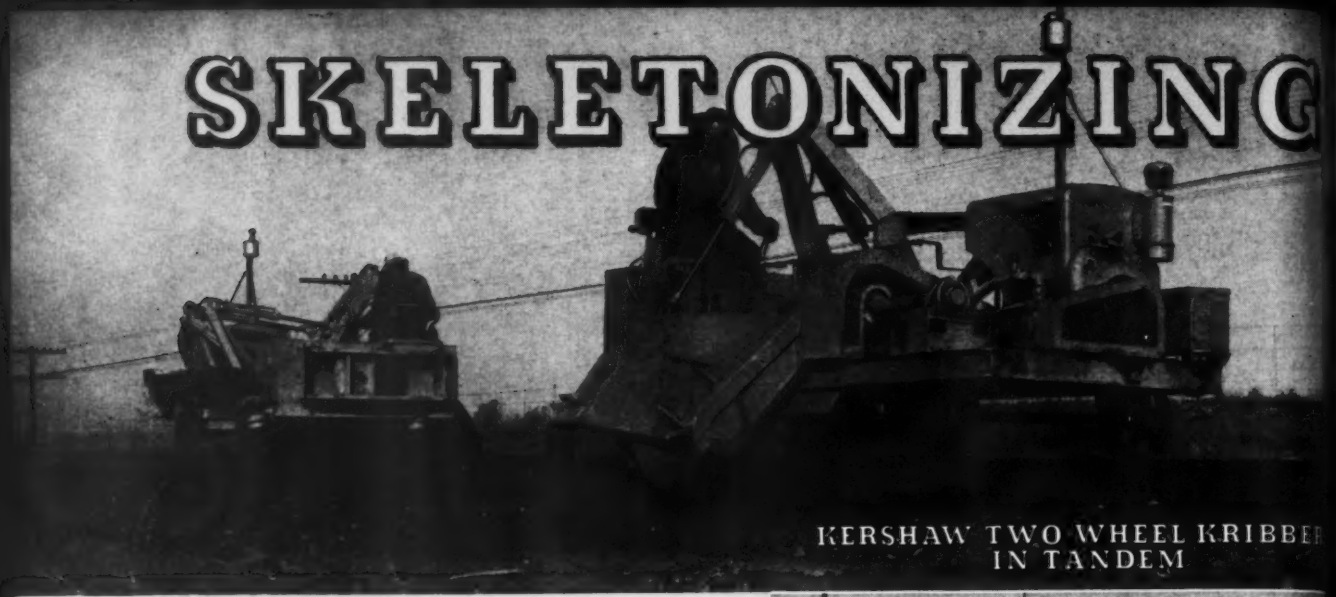
May 1960

Long spans swapped on rising tides

p. 36

A Simmons-Boardman TIME-SAVER Publication

SKELETONIZING



KERSHAW TWO WHEEL KRIBBER IN TANDEM

WITH THREE

KERSHAW

MACHINES

Here's a skeletonizing (ballast stripping) gang including only three machines that can maintain an average production of 400 feet of track per hour. All you need is two Kershaw Two-Wheel Kribbers and one Kershaw Tie-Bed Cleaner, and operators for each machine.

The Kribbers, working back-to-back in tandem, clean out all ballast from the center of the track and between the ties outside the rails. The Tie-Bed Scarifier, equipped with special feet to do the job, then removes the ballast from beneath the rail, even in cemented ballast conditions.

The result is the cleanly stripped track shown at right.

For additional details on these, and other Kershaw machines, contact any Kershaw representatives or call collect.

KERSHAW MANUFACTURING CO. INC

MONTGOMERY ALABAMA

KERSHAW TIE-BED CLEANER

Special fastener does it better at half the cost

OLD BOLT

The sleeve-type bolt was used as a steel strapping handle for railroad cars. Not only was the weld expensive, but the part had inadequate strength for the holding of heavier loads.

NEW BOLT

Bethlehem fastener engineers designed this forged-eye bolt. A greatly increased strength resulted from both the new design and the use of a heavier material . . . *at half the cost of the old style bolt!*

Our ability to redesign fasteners is just one example of how our fastener engineers can study your problem. Perhaps a minor change—or a completely different design—can do your job better . . . and at lower cost. Bethlehem makes just about every type of steel fastener specialty—forgings, rods, bolts, nuts, and stampings.

Just send us a rough pencil sketch or drawing of the part you need, indicating dimensions. After our fasteners engineers have studied it, we'll give you our honest appraisal of what we can do for you. If we can't recommend a practical solution, we'll say so. But if we can help you, and you are fully satisfied with our estimate, we're prepared to give you fast delivery. Just phone our nearest sales office.

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AN EXCEPTIONALLY ADVANTAGEOUS TRIPLE-PURPOSE MACHINE!!

THE JACKSON JACK-SPOT TAMPER

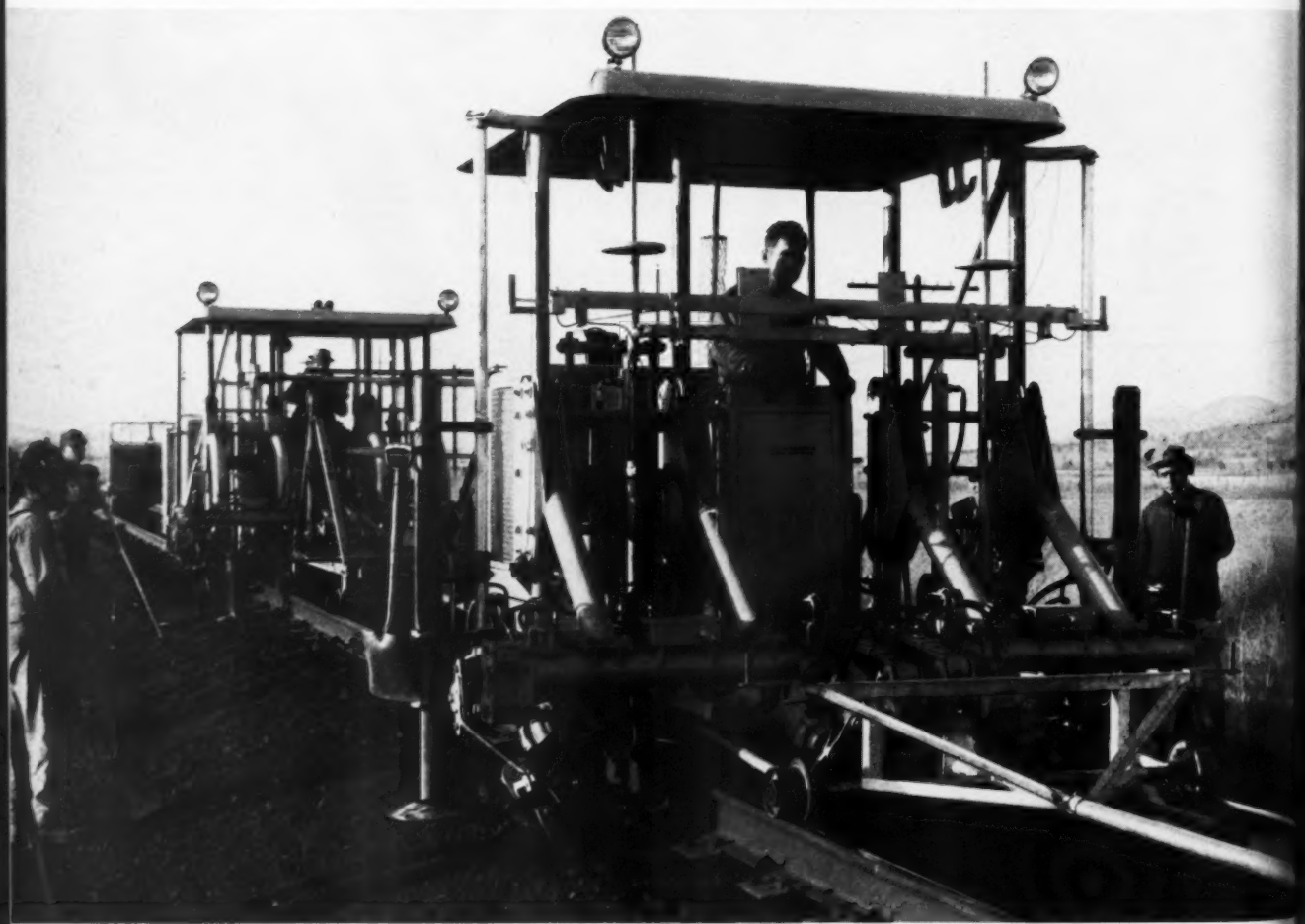
TOPS FOR JACK TAMPING. It's exceptionally fast, accurate and positive in jacking to reach and hold the track raise and cross level. It quickly and firmly tamps tie to hold raise for production tampers and keeps out of their way. Adapted to existing track surfacing equipment.

PERFECT FOR SPOTTING AND SMOOTHING. Great power and speed for spotting and smoothing in all ballasts and in all conditions is supplied by TRACK MAINTAINER tamping units.

AN EXCELLENT PRODUCTION TAMPER for moderate to high raise work. Produces complete ballast consolidation in out-of-face raises, with maximum stability right under the rail — the load bearing zone. Ideal as an all-round production tamper for those requiring an all-purpose jacking-and-tamping machine.

ENTIRELY PUSH-BUTTON OPERATED. This machine is the product of intensive research, development and exhaustive testing. All operations are electrically controlled and push-button operated . . . the most advanced machine of its kind to be found anywhere. Write, wire or phone for complete information.

Attractive acquirement plans



JACKSON JACK-SPOT TAMPER and MAINTAINER tamping in volcanic ballast.

JACKSON VIBRATORS, INC.

LUDINGTON, MICHIGAN

Railway TRACK and STRUCTURES

MAY

1960 • Vol. 56, No. 5

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Why five basic turnouts? 25
A panel at the recent AREA convention gives the reasons why the Nos. 20, 15, 10, 8 and 6 turnouts were chosen for standardization.

Failing stone wall reconditioned by grouting 28
Tells how the Monon restored a failing 400-ft stone wall to a sound condition by injecting grout to bind courses together.

Track rehabilitation with ICC-approved loan 29
The chief engineer of the Georgia & Florida describes how $1 million is being used in carrying out program to rebuild 182 miles of main track.

M/W career for a bright young man 32
Here's the rest of the answers to the question recently posed by our "What's the Answer?" editor on this subject.

Shoo-fly carried on fill between sheet-pile walls 35
Describes three-track structure used by the C&NW to carry trains around a construction site. Embankment also supports temporary station.

Tidewater helps position long lift span 36
Relates how the PRR replaced a fixed span in its Delair bridge at Philadelphia with a 542-ft double-track vertical-lift span.

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◀ Don't miss . . .

New York Central has developed a special machine for use in rehabilitating road crossings ahead of surfacing gangs. Besides trenching and ditching, it removes lag screws, planking and asphalt.

. . . in the June issue

WHICH IS BEST
3 new series Cat Motor Graders

NEW	NEW	NEW
No. 12	TURBOCHARGED No. 112	No. 112
Series E	Series F	Series E
115 HP	100 HP	85 HP

for higher production, easier servicing and long life!

No machine is better than its engine—and the new Cat Diesel Engines in these three new series Motor Graders are better than ever. They're more compact, more rugged and modern in design. They incorporate the latest developments in metallurgy and technology. They provide three important bonuses—greater lugging ability in tough going, easier servicing and long life.

A COMPLETE LINE—85 HP to 150 HP

The new Turbocharged 100 HP No. 112F is designed for high production to match work requirements between the new 85 HP No. 112E and new 115 HP No. 12E. Compared with the 85 HP model, the 100 HP machine delivers 5% higher travel speeds and a 5% increase in blade speed control. With its introduction into the line, Caterpillar now offers you a choice of four Motor Graders in all to meet your specific requirements. The largest is the Turbocharged 150 HP No. 14, the most versatile big grader ever developed.

SEE YOUR CATERPILLAR DEALER

Some of the features of the new Cat Motor Graders are described briefly here. But for the complete picture, see your Caterpillar Dealer. Ask him to show you how they're a better buy for your money than ever. Take a look under the hoods at the new modern-design engines. Better still, ask for a demonstration.

See how they "pull through" tough going.

Caterpillar Tractor Co., General Offices, Peoria, Ill.

CATERPILLAR

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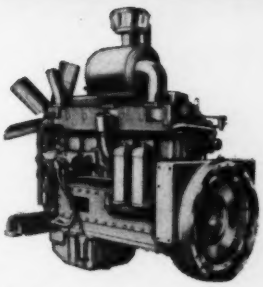
MODERN HEAVY-DUTY MOTOR GRADERS TO FIT ANY JOB

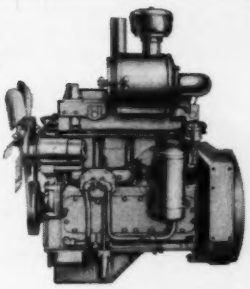
FOR YOUR JOB?
with new compact engines!

New No. 12E Motor Grader features new compact 115 HP Engine



New No. 112E Motor Grader features new compact 85 HP Engine

The new No. 112F is similar in appearance, but features a Turbocharged 100 HP Engine.

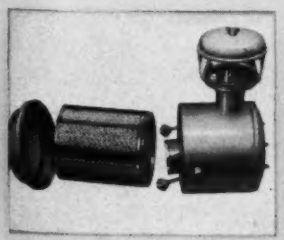


NEW HIGH TORQUE. Though the engines in the new Cat Motor Graders are designed specifically for each machine, they all develop higher torque than previous models and have other basic improvements in common. For example: shorter, stiffer blocks and crankshafts... stronger, distortion-resistant cylinder heads... improved cooling systems with greater capacity... engine lubricating oil conditioning... and advanced design fuel systems —new, compact fuel injection pumps with barrel and plunger assemblies in easy-to-service pump housings.

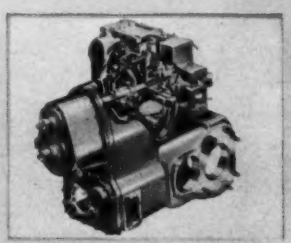
NEW STARTING ENGINE. Now standard is a new two-cylinder, vertical starting engine to replace the horizontal engine. All three Motor Graders use a modern 12-volt electric system. An optional 24-volt system is available for use in moderate climates where direct electric starting is practical.

PERFORMANCE-PROVED FEATURES. While many advances have been designed into the compact new engines, certain time-tested features have been retained. To mention a few: precombustion chamber design that delivers maximum horsepower on heavy, economy-type fuels... steel-back aluminum bearings... wet-type "Hi-Electro" hardened cylinder liners... and aluminum pistons with cast-in ring band.

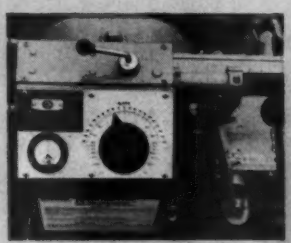
OTHER HIGH-PRODUCTION FEATURES IN CAT MOTOR GRADERS



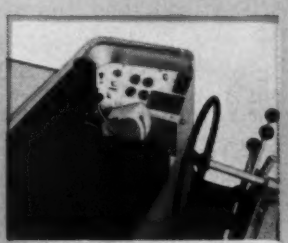
NEW DRY-TYPE AIR CLEANER (standard) removes a minimum of 99.8% of all dirt from intake air during every service hour. Can be serviced in 5 minutes. Cuts your maintenance time by as much as 70% and substantially reduces maintenance costs. Cleaner air also extends engine life.



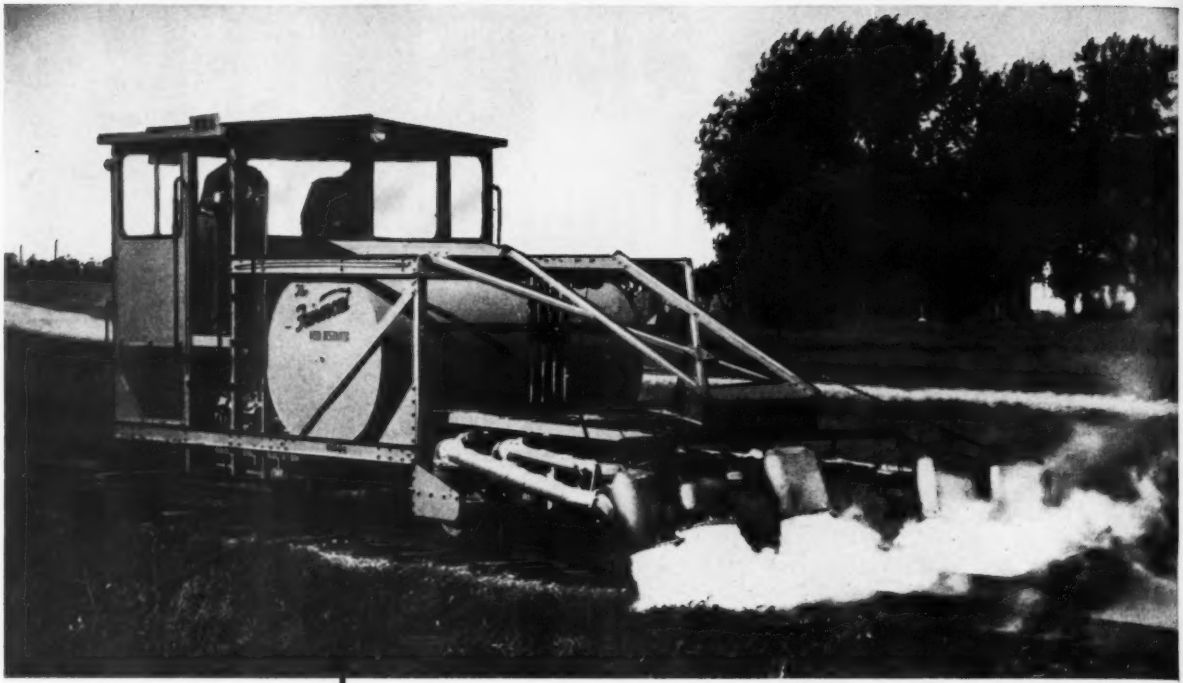
EXCLUSIVE OIL CLUTCH (standard) provides up to 2000 hours service without adjustment, the equivalent of about 12 months of "adjustment-free" operation. A Caterpillar development proved by millions of hours of use, it virtually eliminates down time for clutch repair.



AUTOMATIC BLADE CONTROL (optional) cuts grading time in half. Operator sets desired slope on dial and only has to control depth of cut. Manufactured by Preco Incorporated, the unit automatically maintains blade slope within ⅛" in 10'. Available factory installed.



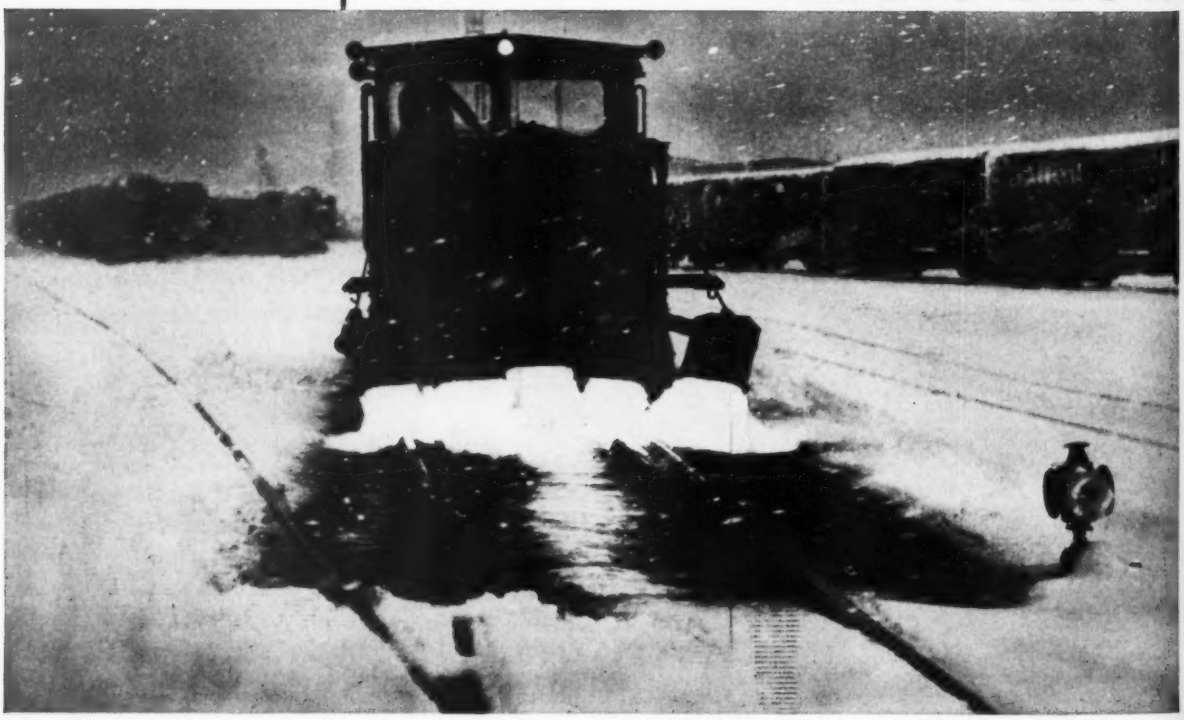
IN-SEAT STARTING (standard) offers operator finger-tip convenience and positive starts in any weather. Another feature: Improved mechanical blade controls provide precise adjustment and ease of engagement. "Anti-creep" lock makes blade stay put under load.

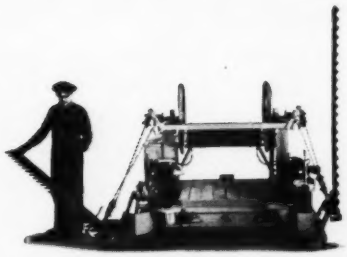


KILLS WEEDS

FAIRMONT

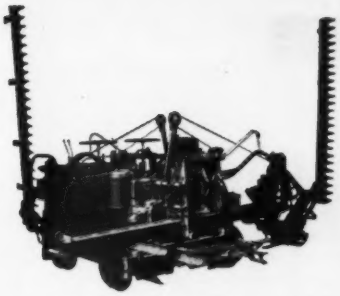
MELTS SNOW





M5 SERIES A WEED MOWER

is a sturdy unit with simplified controls. Equipped with an automatic cutter bar release.

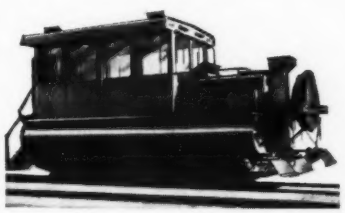


W24 SERIES A WEED MOWER

Accurate hydraulic control allows close mowing. Hydraulic sickle drive means smooth operation.

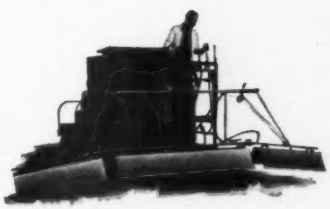
W66 SERIES B WEED SPRAYER

Complete, self-propelled unit provides maximum availability, high maneuverability in one machine.



W78 SERIES B WEED SPRAYER

High quality, low-cost unit for branch lines, short lines, yard tracks. Easy to operate.



...PAYS ITS OWN WAY!

Here's the Fairmont W55 Series C Weed Burner and Snow Melter—a versatile "fire eating dragon"—that will control your weed problems in summer, and protect your railroad yards next winter, at a huge saving in man hours!

As a weed burner, the Fairmont W55 can spread its five open-flame-type burner heads (four hydraulically positioned) to burn a width of twenty five feet in one trip. Each air-cooled burner head has three atomizing nozzles to produce a hot, thick, uniform flame. The intense heat of the flame—approximately 2,500°F.—provides maximum penetration and killing effect. The Fairmont W55 is equipped with a three-speed mechanical drive plus a torque converter to meet speed requirements of all burning conditions. Fairmont also builds the W56 Series A Weed Burner that uses propane as a fuel for the burner heads, and also for the propelling and pump engines.

In snow melting service, the Fairmont W55 will clean from fifteen to twenty switches and retarders an hour—replacing 50 to 100 men using brooms and shovels. Equipped with a four-wheel drive and a variable-speed hydraulic drive for speeds less than one mile per hour, the Fairmont W55 not only melts snow and ice, but steams away water leaving switches dry and free. Economical? The man hours saved in one storm alone can pay the original cost of the Fairmont W55!

Plan now for weed and snow protection. Call or write today for full information on the Fairmont W55 Series C Weed Burner and Snow Melter.

FAIRMONT RAILWAY MOTORS, INCORPORATED • FAIRMONT, MINNESOTA

Railway TRACK and STRUCTURES

NEWS ABOUT PEOPLE

AKRON, CANTON & YOUNGSTOWN—S. J. Watkins, assistant superintendent-assistant engineer at Carey, Ohio, has been promoted to track supervisor there, succeeding **C. M. Brown** who retired on March 31 after nearly 50 years of service.

ALABAMA, TENNESSEE & NORTHERN—D. F. Richardson, assistant engineer on the Frisco at Amory, Miss., has been promoted to supervisor track and structures on the AT&N, a subsidiary of the Frisco, with headquarters at York, Ala., succeeding **E. G. Nordan** who has retired after more than 46 years of service.

CHATTAHOOCHEE VALLEY — Gordon W. Neal, superintendent, West Point, Ga., has been elected to serve on the board of directors.

CHESAPEAKE & OHIO—Robert E. VanderKlipp, special representative in the operating department at Detroit, Mich., has been promoted to assistant division engineer at Saginaw, Mich. **Robert F. Stanton** has been appointed supervisor water supply and work equipment at Cincinnati, Ohio, succeeding **J. T. McGuire** whose death was announced in the March issue.

ELGIN, JOLIET & EASTERN — Bernard F. Riegel, assistant supervisor of work equipment, Gary, Ind., has been promoted to supervisor track there.

FRISCO—B. C. Davidson, terminal trainmaster at Springfield, Mo., has been appointed trainmaster-roadmaster, with headquarters remaining at Springfield.

LOUISVILLE & NASHVILLE—Howard C. Forman, assistant general manager at Louisville, Ky., and formerly chief engineer, has been promoted to the newly created position of assistant vice president at Birmingham, Ala.

MILWAUKEE—V. E. Glosup, assistant vice-president—operation, Chicago, has been appointed assistant vice president-chief engineer, with headquarters at Chicago. **W. G. Powrie,** chief engineer, Chicago, retired, effective April 8, after 40 years of service.

NEW YORK CENTRAL — The following changes have occurred recently at the locations shown: **Bryan J. Murphy,** assistant engineer at Chicago, to district methods engineer at Indianapolis, Ind.; **Thomas E. Glotfelty,** designer at New York, to assistantant engineer there; and **Homer N. McGill,** bridge and building inspector at Buffalo, N. Y., to materials engineer at Syracuse, N. Y.

NORFOLK & WESTERN—James N. Carter, instrumentman at Bluefield, W. Va., has been promoted to assistant supervisor bridges and buildings at Norfolk, Va., succeeding **James C. Moynihan** who has been promoted to resident engineer—inspection. Mr. Moynihan succeeds **John B. Anderson** who has been appointed industrial agent.

V. E. Glosup
Milwaukee

Morton Friedman
NYC

PENNSYLVANIA—L. E. Ward has been appointed assistant district engineer at Ft. Wayne, Ind., succeeding **L. S. Strohl** who has been promoted to district engineer at Harrington, Del. Mr. Strohl succeeds **W. Glavin** whose transfer to Chicago was announced in the March issue. **A. E. Shaw** has been appointed supervisor track at North Judson, Ind., succeeding **P. M. McMeans** who has been transferred to Aspinwall, Pa.

The following additional appointments have been made recently: **H. N. Lucas, Jr.,** as supervisor methods and cost control at Philadelphia, Pa.; **H. G. Noah** as assistant supervisor track at Trenton, N. J.; **D. A. Shoff** as supervisor track at Monongahela, Pa.; **T. F. Stone** as assistant supervisor track at Washington, D. C.; **M. A. Cerny** as assistant supervisor track at Trafford, Pa.; **M. R. Phillips** as assistant supervisor track at South Chicago, Ill.; and **J. F. Lehman** as general foreman, bridges and buildings, at Chicago.

SEABOARD—Louis Lange, Jr., has been appointed assistant division engineer at Tampa, Fla.

SOUTHERN—John E. Barron, assistant engineer at Cincinnati, Ohio, has been promoted to assistant to chief engineer, Western Lines, at Birmingham, Ala.

TEXAS & PACIFIC—Ernest C. Pondor, assistant engineer at Dallas, Tex., has been promoted to bridge engineer there, succeeding **Alistair G. Rankin** who has been promoted to assistant to chief engineer, also at Dallas. Mr. Rankin succeeds **Floyd R. Naylor** who has been promoted to special engineer, system, with headquarters at Dallas. **J. C. Armistead, Sr.,** water service supervisor, Western division, has been promoted to system water service supervisor, with headquarter at Dallas.

Obituary

C. E. Miller, retired assistant engineer of maintenance of the Chicago & North Western, died at Highland Park, Ill., on March 31, at the age of 77.

R. W. Richardson, retired division engineer on the Chicago & North Western, died at Altadena, Cal., on April 1.

Biographical briefs

Morton Friedman, 65, who recently retired as chief valuation engineer of the New York Central at New York (*RT&S*, Feb., p. 10), was born at Glouster, Ohio, and received his higher education at Ohio State University. Mr. Friedman commenced his railroad career in 1916 with the Pennsylvania-Detroit, now part of the Pennsylvania, as a transitman and draftsman at Detroit, Mich. Two years later he joined the Michigan Central, now part of the NYC, as a draftsman in the valuation department at Detroit. Subsequently he served as junior engineer and assistant engineer, also in the valuation department. In 1950 he was appointed valuation engineer of the Eastern district of the NYC at New York. Mr. Friedman was promoted to chief valuation engineer in 1951.

Wendell R. Wilson, 58, who was recently promoted to assistant bridge engineer, system, of the Santa Fe at Chicago (*RT&S*, Nov. p. 10), was born at Portland, Pa., and graduated from Stanford University in 1925 with a Bachelor of Arts degree. Mr. Wilson entered the service of the Santa Fe in 1927 as a bridge draftsman. Two years later he was promoted to assistant engineer. In February 1942 he entered military service in the U. S. Army, serving with the Field Artillery Corps in the European Theatre of Operations. Mr. Wilson returned to the position of assistant engineer four years later, serving in that capacity at Chicago until his recent promotion.

George R. Janosko, 33, who was recently appointed assistant manager roadway maintenance of the Norfolk & Western at Roanoke, Va. (*RT&S*, Feb., p. 10), was born at Richmond, Va., and graduated from the Virginia Polytechnic Institute in 1948 with Bachelor of Science degree in civil engineering. Mr. Janosko entered railway service in 1948 with the Virginian as a junior engineer. He was promoted to assistant engineer at Roanoke in 1951, serving also in that capacity at Norfolk, Va. In 1956 he was further promoted to assistant engineer maintenance of way—system at Norfolk, the position he held at the time the Virginian was merged with the N&W.

Homer L. Woldridge, 56, who was recently promoted to assistant chief engineer-methods of the Frisco at Springfield, Mo. (*RT&S*, Jan., p. 10), was born at Breckenridge, Mo., and received his higher education at the University of Missouri. Mr. Woldridge entered the service of the Frisco in 1927 as a rodman at Springfield. He was promoted to transitman the following year. After a year's lay off due to force reduction he became track welder helper at Springfield in 1931 and track welder two years later. Mr. Woldridge was appointed

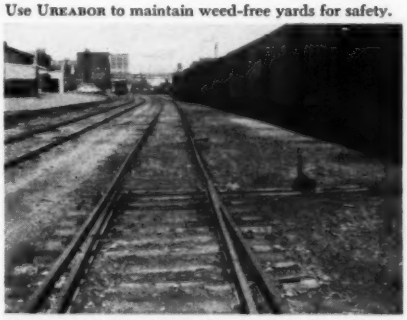
(Continued on page 70)

You can bet your budget dollars...

UREABOR® stops weeds

A low rate of application effectively destroys weeds and grasses... prevents regrowth. Easy to apply...nothing to mix...no water to haul. Nonflammable, noncorrosive, nonpoisonous when used as directed.

Use UREABOR to maintain weed-free yards for safety.



UREABOR protects trestles from fire-hazardous weeds.

Use of UREABOR keeps signal areas clear of weeds.

You can maintain weed-free areas anywhere at low cost, with the least amount of labor, by choosing UREABOR weed killer for the job... *that's a proven fact!* But you get other benefits too! Service, for instance. Only capable, experienced field personnel promote the sales of UREABOR. They can stretch your budget dollar for weeds because each man is thoroughly trained to solve every specific weed problem. You get sound advice, backed up by years of field experience, on how to make the most efficient use of our herbicide material. You also have a choice of hand-operated or power-driven mechanical spreaders. Equipment specifically designed to apply UREABOR to best advantage and to fit into every field use.

As you may know, U. S. Borax & Chemical Corp. pioneered the field of dry herbicides... with particular emphasis on railroad requirements. Continuing research over the years has yielded our successful scientifically formulated herbicides. Each gives outstanding results on vegetation... each makes use of the proved plant-destroying action of borates. So, for *your* weed problems, get the right answers. Get in touch with us today to get the *most* for your weed-killer dollar!

UNITED STATES BORAX & CHEMICAL CORPORATION

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greater holding power

is only one reason why FAIR is the world's largest selling rail anchor

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T-POWER DESIGN MEANS GREATER HOLDING POWER

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Railway TRACK and STRUCTURES

NEWS NOTES . . .

. . . a résumé of current events throughout the railroad world

Secretary of Labor Mitchell and the AAR had differing views after the Secretary, in effect, advised the carriers and the brotherhoods to settle their work-rule dispute someplace else than at the bargaining table. When Mr. Mitchell proposed that the problem be assigned to study outside the processes of the Railway Labor Act, the AAR responded "We are sorry the Secretary did not hold the same view 14 months ago when the railroads first proposed an impartial presidential commission to study the featherbedding work-rules problem which he now says is too big to be settled at the bargaining table."

Class I railroads' February net income is estimated by the AAR at $28 million—up $6 from a year ago. The net for the first two months is estimated at $55 million, an increase of $13 million over the same period last year. However, 37 Class I roads failed to earn their fixed charges in this year's first two months. Rate of return for the 12 months ended with February averaged 2.76 per cent.

C&NW's purchase of the M&StL, which was approved last month by the directors of the two roads, marks another step by merger-minded railroads to redraw the nation's transportation map. The merger of the N&W and the Virginian was one step. This was followed by an ICC examiner's approval of the Erie-Lackawanna union, the control by the Santa Fe and PRR of the TP&W, and a plan to merge the Soo Line, Wisconsin Central and DSS&A. Currently under study are the proposed Rock Island-Milwaukee merger, the GN—NP—CB&Q—SP&S consolidation and the ACL—SAL merger.

This year's gross capital expenditures are now expected to be 10.8 per cent above the 1959 total. This is indicated by estimates submitted to the ICC by 106 of the Class I line-haul railroads. They expect to spend $859.2 million this year compared with the $775.5 million they spent last year. The 1959 total for all Class I line-haul roads was $818 million.

A six-man panel is conducting arbitration hearings in Chicago on the wage dispute between the carriers and the Brotherhood of Locomotive Engineers. From April 5 to 21 the panel heard arguments by the BLE for a 12-per cent wage increase and a continuation of the cost-of-living escalator clause. After a week's recess, the carriers began presentation of their case for a 15-cents an hour wage reduction and elimination of the escalator clause. The findings of the arbitration panel are binding. They are expected to set the pattern for settlement of pending wage disputes with other operating unions.

Meanwhile, the National (Railway) Mediation Board notified President Eisenhower that the wage dispute between the non-ops and the carriers threatens to halt essential transportation service, thus clearing the way for creation of an emergency board to hear the case.

Public relations wanted!

The general foremen of track gangs are important to the railroad for obtaining a high production. But they also have responsibilities in dealing with the public.

Recently, a gang was surfacing a track where it bisected a small town. A small unit worked ahead of the main gang rehabilitating the road crossings. When this unit reached the last of the town's three crossings, the main gang was already tamping the track through the first two.

As a result, all of the town's road crossings were out of service. Residents on one side could not drive to stores on the other side. In addition, all the fire equipment was on one side of the track.

Soon, telephone calls alerted one of the town's "fathers." He drove from one crossing to another looking for a man with the authority to rearrange the work so one crossing could be kept open for traffic. Meanwhile, the general foreman had been called to a company telephone by the dispatcher for the purpose of discussing the fleeting of trains.

The town official could not find anyone who would listen to him. Exasperated, he said, "To h— with trying to get cooperation from the railroad! I'm going to get the sheriff." Just then, the general foreman emerged from the booth and, after being apprised of the situation, he talked with the town official. As a result, the work was revised to keep one of the crossings open.

Nevertheless, a bad impression had been made. This could have been prevented if the general foreman had previously sought out the town official, advised him of the approaching gang and then arranged the work in such a way as to keep at least one crossing open.

Don't neglect the high school graduates!

For many years the railroads have been putting a great deal of emphasis on the desirability of attracting technically trained men into the industry. Civil engineering graduates have been a particular target of these efforts. The reasoning is that such talent is needed for advancement to administrative positions, not only in engineering but in other departments as well.

In furthering their efforts to obtain a share of graduate engineers, many roads have recruitment programs in which representatives visit a select list of colleges for the purpose of interviewing members of the senior class. The salaries offered are such as to compete with those held forth by other industries. In addition, the technical men are frequently offered the opportunity of enrolling in training courses designed to fit them for higher jobs in various departments. Very frequently also the employment of these graduates is handled in such a way that seniority is not a factor in their advancement.

These efforts that the railroads put forth to obtain technically trained men are commendable. There can be no question that men with technical training, and with the intelligence needed to absorb such training, are necessary to assure the future of the industry.

On the other hand, is there danger that this emphasis on the need for college graduates may have tended to obscure the fact that there are opportunities in the M/W field, and in railroading generally, for young men whose education is limited to a high school diploma?

There is plenty of evidence to prove that it is not necessary for a man to have a college education to serve successfully in an M/W supervisory position, such as track supervisor, roadmaster or supervisor of bridges and buildings. In fact, in former years, it was unusual to find a man in these positions who had gone higher than the eighth grade.

There are various reasons why intelligent, ambitious young men sometimes do not progress beyond a high school education. Some are financially unable to do so. With others it is a matter of temperament. In any event they frequently have the ability, the sense of responsibility and the leadership qualities that are required of M/W supervisory officers. Any additional technical training needed can be acquired by taking night or correspondence courses.

The fact is that the railroads need high-school graduates to fill supervisory positions in the maintenance of way department. To obtain a sufficient supply of such men for these positions it may be necessary for them to undertake recruitment programs on the same, or even greater, scale as those now used to attract college graduates. And if these efforts are to be successful they must be accompanied by convincing evidence that ways can be found to overcome the stumbling block presented by the seniority rule.

The income and other benefits and satisfactions attached to M/W supervisory positions are such as to be attractive to intelligent, ambitious young men just out of high school. But they will have to be told of these advantages before they can be expected to give serious consideration to making railroading their life's work.

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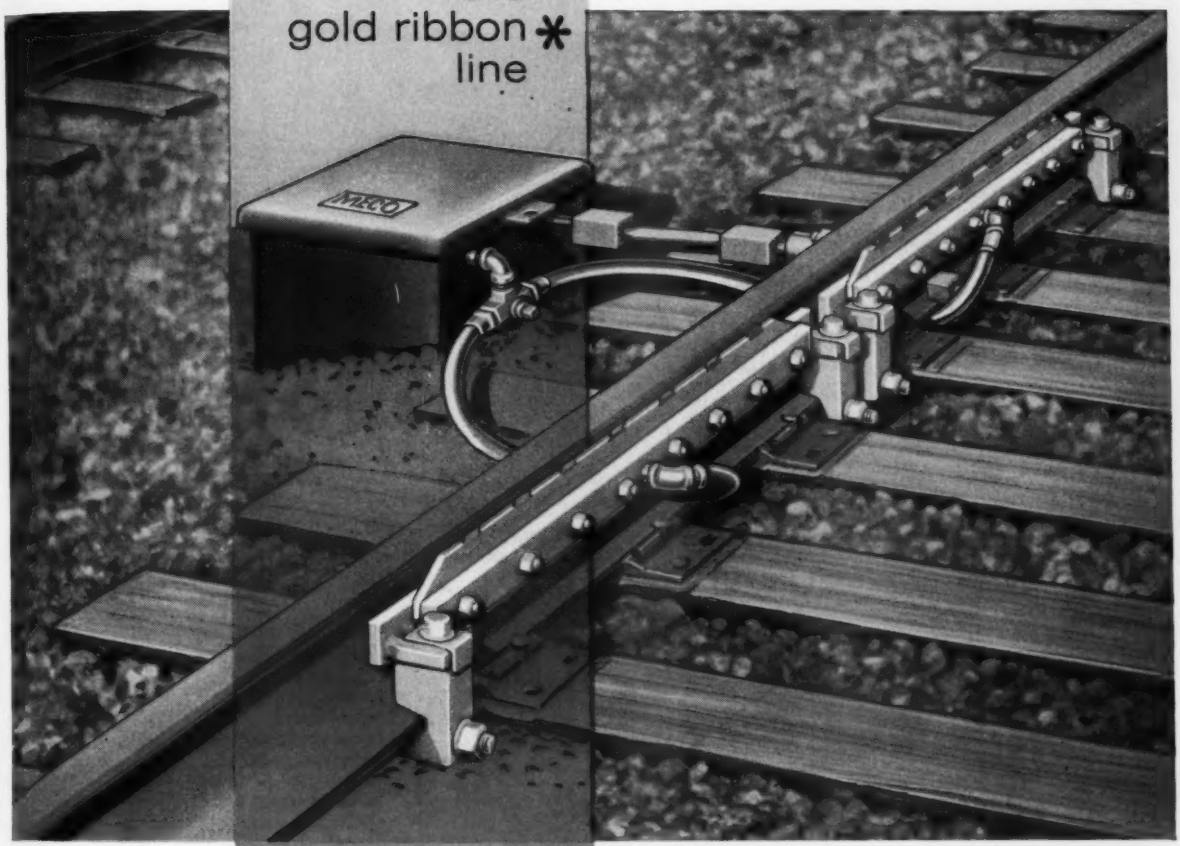
the gold ribbon * line



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SPECIFICATIONS FOR 57-BP TIE HANDLER

POWER PLANT: 4 cylinder air cooled gasoline engine—electric starter.
POWER TRANSMISSION: Hydraulic.
TRAVEL SPEED: 7½ to 15 M.P.H.
TRANSMISSION: 2-speed selective type.
ROTATING DECK: 360°.
TONGS: Rotate 260°.
TONG OPENING RANGE: 5" to 16½".
BOOM: Box type—17' standard length, from Center Pin.
BOOM: 5' or 7' intermediate section—optional—Extra charge.
BOOM: Travel—60° with boom parallel to track, 30° in either direction, up or down.
TRANSVERSE SET-OFF WHEELS: Optional—Extra charge.
CLEARANCE: Height—72". Width 65".
SWING: 6' 2" (measured from center pin).
WHEEL BASE: 60".
OVERALL LENGTH: 10' 8".
WEIGHT: Approximately 7000 lbs.

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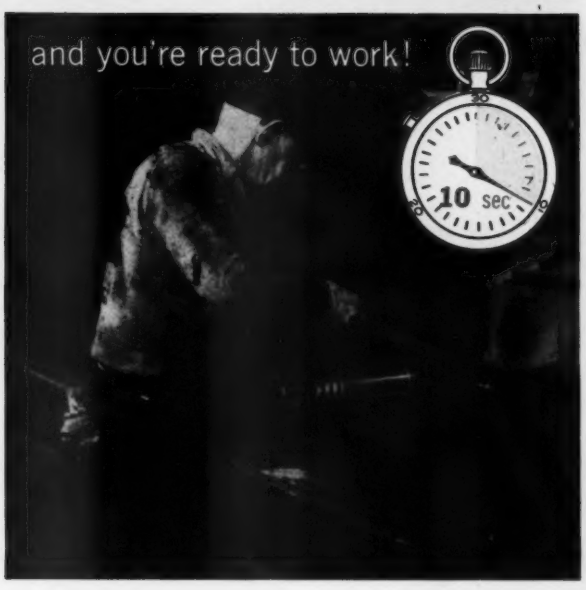

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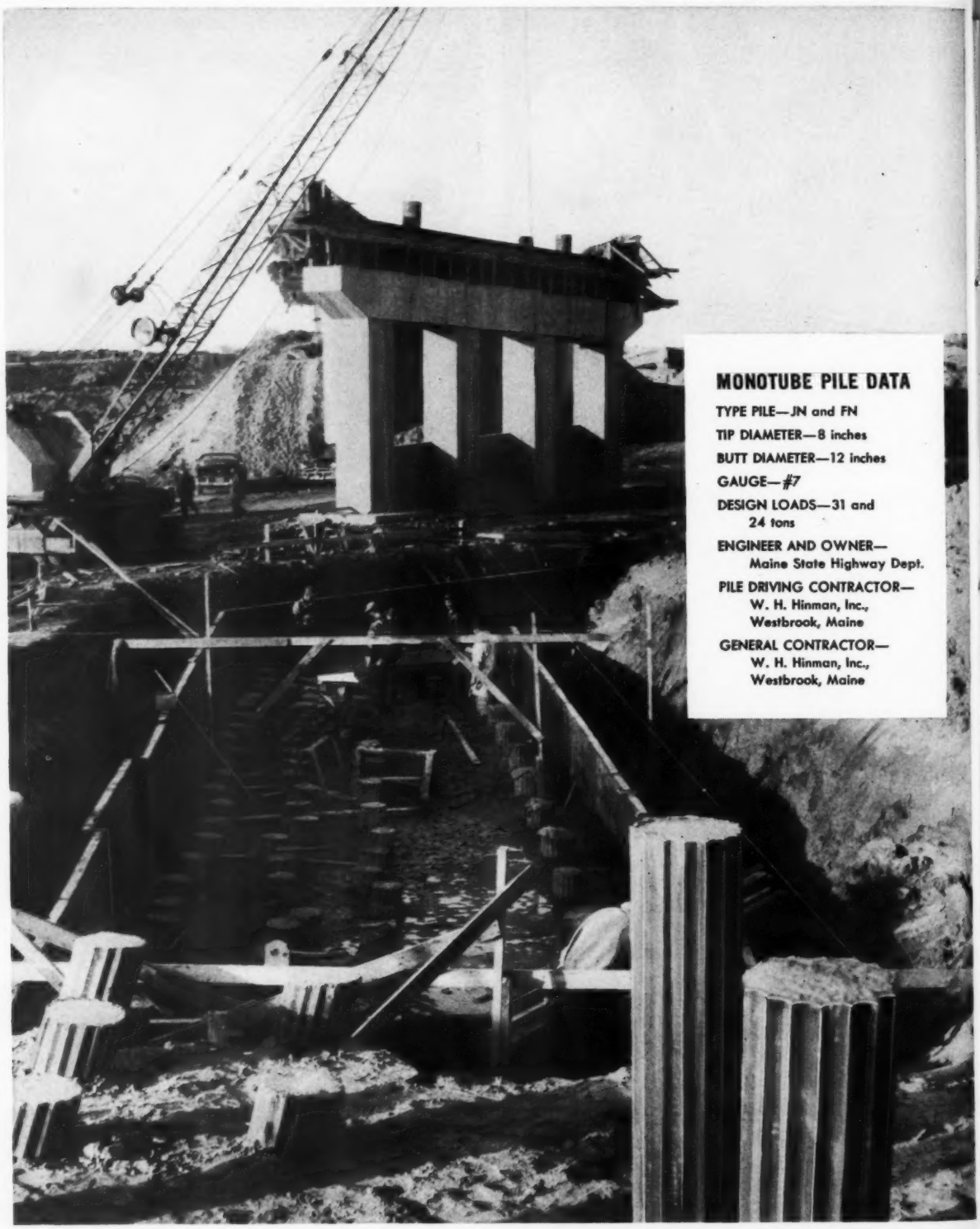

MONOTUBE PILE DATA

TYPE PILE—JN and FN

TIP DIAMETER—8 inches

BUTT DIAMETER—12 inches

GAUGE—#7

DESIGN LOADS—31 and 24 tons

ENGINEER AND OWNER—
Maine State Highway Dept.

PILE DRIVING CONTRACTOR—
W. H. Hinman, Inc.,
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GENERAL CONTRACTOR—
W. H. Hinman, Inc.,
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STRENGTH AND STABILITY with cold-rolled Monotube steel piles for this skew bridge, Portland, Maine. High yield-strength Monotubes overcome severe driving conditions and resist horizontal forces inherent in skew bridge design.

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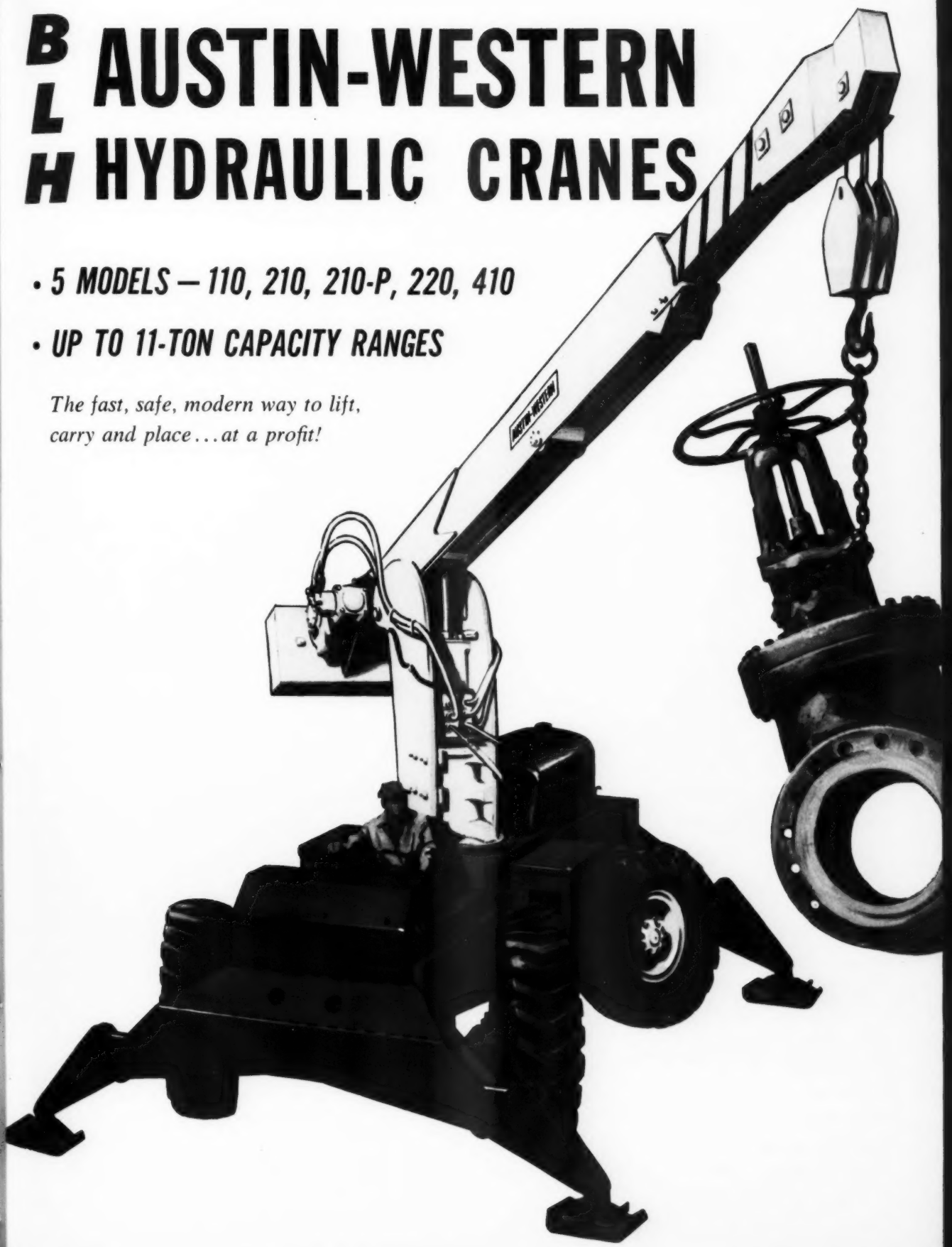


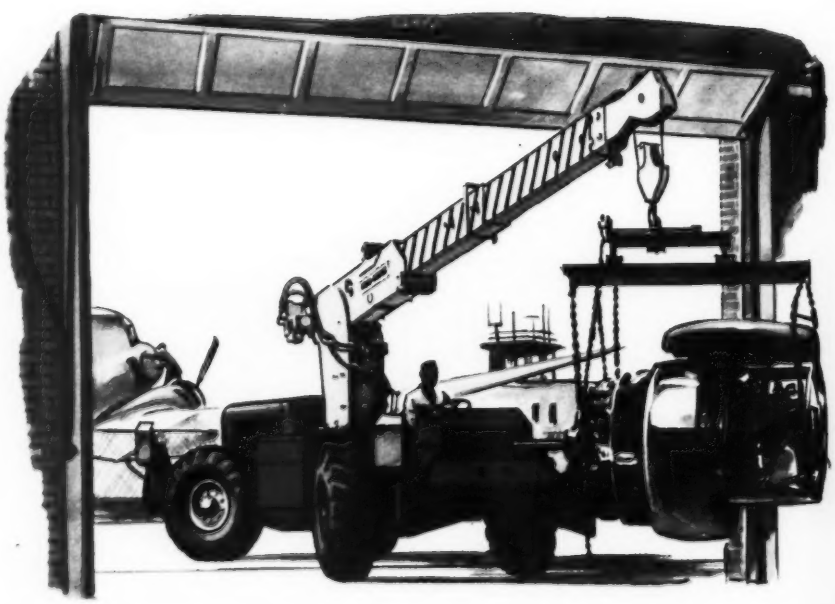
Austin-Western's telescoping delivers unequaled precision,

MODEL 110

5-ton range — The 110 is the mighty midget of the A-W line—but what a midget! It'll outlift all other 3-wheel cranes over-the-side! It's industry's answer to fork truck limitations. The 110 has an 18 ft. 7 in. boom reach; 220° boom swing. Low 8 ft. 10 in. overhead clearance. Operates with ease in close quarters; handles loads in 5-ton range.

Features dual front driving wheels; dual tire rear trunnion power steer — road speeds from 2 to 18 mph. Torque converter and full hydraulic reversing mechanism standard. The unit can be tailored to your particular job needs with various combinations of features and equipment.

MODEL 210



7-ton range—This basic model of the hydraulic crane line is rubber mounted, self-propelled; capable of road speeds up to 35mph. A real workhorse for an astounding variety of lift, carry and place assignments. 18-foot telescoping boom rotates in continuous full circle, maximum 35-foot boom reach optional. All-wheel steering gives unlimited maneuverability in tightest spots; all-wheel drive means plenty of traction for loaded boom travel on any surface. Low overhead clearance. Operation is fully hydraulic, including outriggers.

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- *Extends and retracts*
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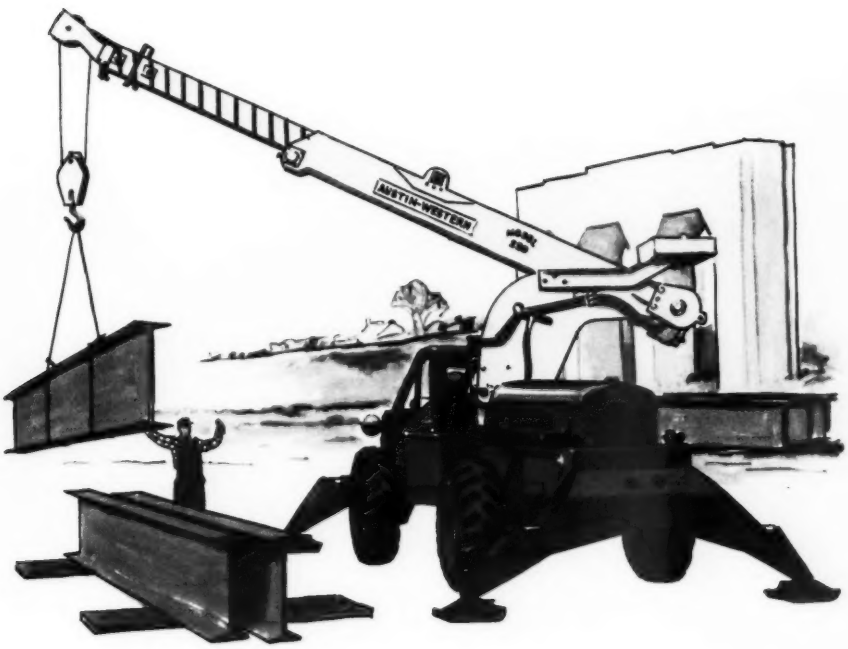
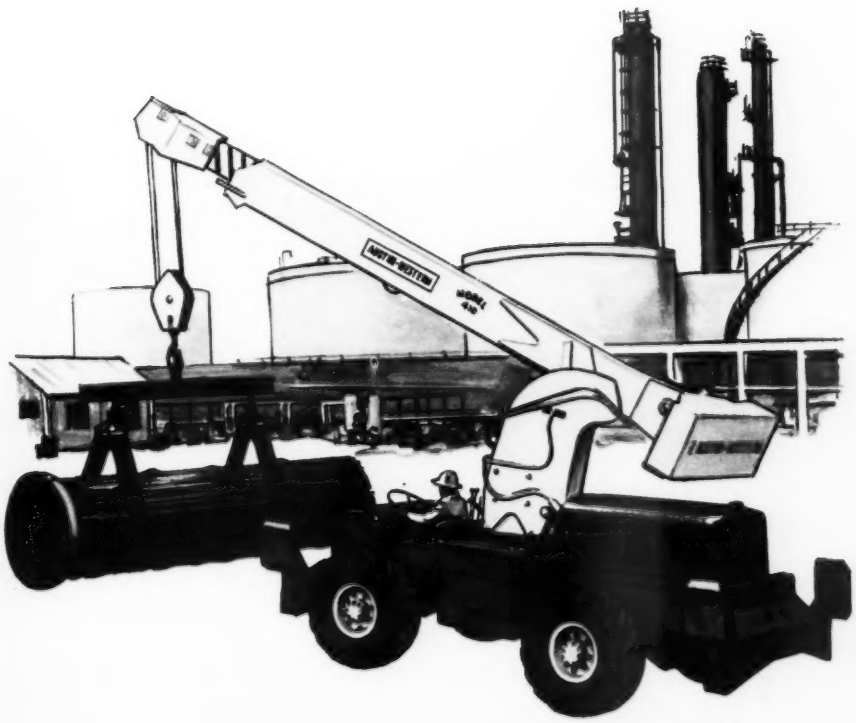
- *Reaches up and in*
- *Reaches out and over*
- *Full hydraulic control*
- *Two or more movements with full boom load*
- *Continuous full circle rotation on most models*



MODEL 220

8-ton range—The Model 220 is a modified version of the basic Model 210. Its counterweighted boom as well as heavier structural design give it added lifting capacity into the 8-ton range. Like the 210, it features an 18-ft. telescoping boom, with maximum 35-ft. boom reach optional; continuous full circle swing; all-wheel drive and all-wheel steering. Full hydraulic controls mean tops in precision, safety, ease of operation.



MODEL 410

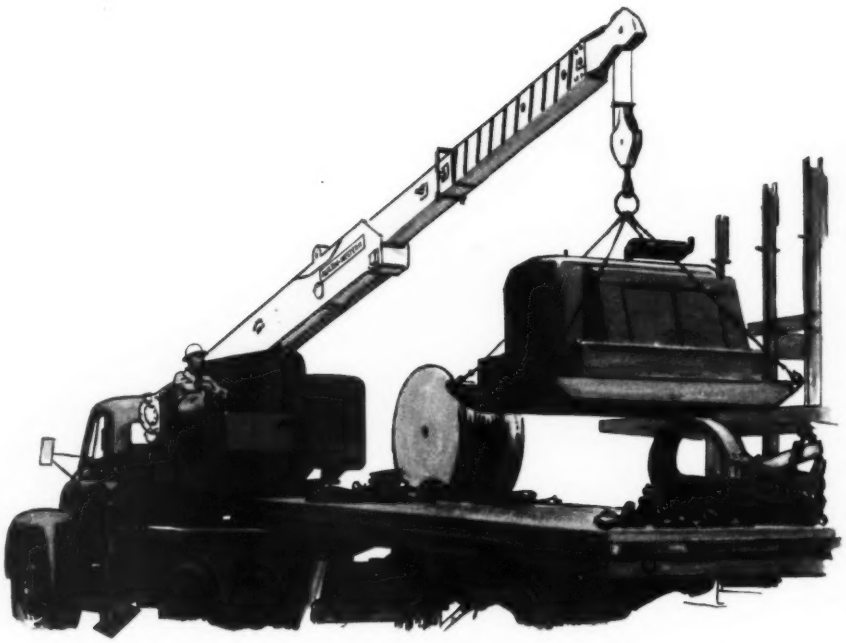
11-ton range — This big brute, the Model 410, is the heavy-duty unit in the A-W crane line. Like the 210 and 220, it is self-propelled; 25-ft. telescoping boom rotates in continuous full circle with maximum 48-ft. boom reach optional; raises to a 60° angle from horizontal.

Gas or diesel power; all-wheel drive and all-wheel steer are available. Travels from job to job at road speeds to 30 mph. This rugged, mobile crane is the rig for you if you need big crane capacity without sacrificing the profitable advantages of flexibility, versatility and mobility inherent in all models of Austin-Western hydraulic cranes.

MODEL 210-P

FOR TRUCK OR STATIONARY MOUNTING

7-ton range—The Model 210-P is the famous Austin-Western live 210 hydraulic boom . . . available as a package unit for truck or stationary mounting. Its 18-ft. telescoping boom rotates in a continuous circle; maximum 35-foot boom reach optional; lift capacity is in the 7-ton range. Can't be beat for crane applications requiring a high degree of mobility. This unit, like all other A-W cranes, can be equipped with a wide variety of attachments for extra versatility—such as clamshell, orange peel, maintenance platform, etc.



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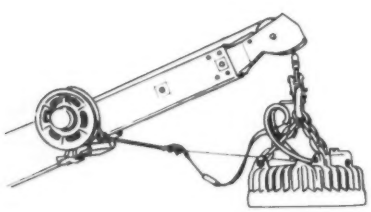

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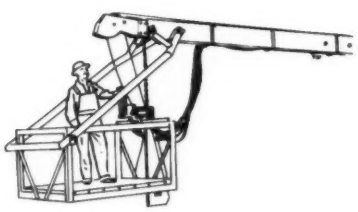

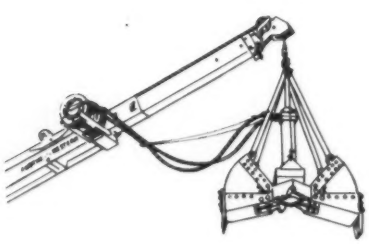

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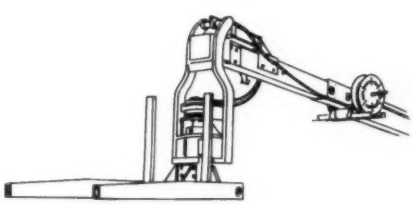

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AREA
panel discussion

Why five basic turnouts?

At the AREA convention in March, the association, acting on a recommendation of the Track committee, overwhelmingly adopted the principle of standardizing on five basic turnouts. In so doing it extended approval for the Track committee to proceed with the preparation of standard plans for these turnouts, the plans to be submitted for approval at a later convention, possibly 1961. The intention is to place the plans in the front of the Portfolio of Trackwork Plans and other remaining plans in the back as information.

Three of the turnouts are recommended for main-track use and two for yard and switching movements. For main-track movements, the No. 20 with 39-ft curved switches is recommended for high speeds, the No. 15 with 26-ft curved switches for medium speeds, and the No. 10 with 16-ft 6-in straight switches for low speeds. For yard and switch movements, the No. 8 turnout with 16-ft 6-in straight switches is recommended for normal use and the No. 6 turnout with 11-ft straight switches for locations in congested areas.

It was anticipated that many questions would arise at the convention regarding the proposal to standardize on the five turnouts. To provide answers to the questions the vote on the proposal was preceded by a panel discussion of the subject, the panel consisting of members of the Track committee's subcommittee on Standardization of Trackwork Plans. The discussion follows:

Members of the panel

Moderator:
S. H. Poore, assistant engineer, Chesapeake & Ohio

Panelists:
M. C. Bitner, manager of methods and cost control, Pennsylvania
F. W. Creedle, chief engineer, Ramapo Trackwork Products, American Brake Shoe Co.
T. R. Klingel, chief engineer, Soo Line
M. J. Zeeman, engineer of track design, Atchison, Topeka & Santa Fe

Moderator: Why pick three main-line turnouts? I believe Mr. Klingel will be a good man to answer that one.

Klingel: To secure the maximum benefits of standardization, it was necessary to select the minimum number of turnouts that would fulfill the requirements for all typical locations. The committee concluded that three turnouts should be selected that would permit speeds which conformed with current signal practice for diverging-route operation over high-speed, medium-speed and low-speed turnouts. The No. 20 turnout was selected as the high-speed turnout, the No. 15 as the medium-speed turnout, and the No. 10 as the low-speed turnout. It is our opinion that these three turnouts will provide adequate choice of permissible speeds to permit selection of the proper turnout to meet practically all requirements for main-line operation.

Moderator: Why the No. 15 for medium speed and not a No. 16 or 14?

Klingel: The usual practice in this country at the present time is to allow speeds up to 35 mph with medium-speed signal indications for diverging routes. The No. 15 turnout with curved switch points permits speeds of 38 mph for lateral turnouts and 53 mph for equilateral turnouts. This turnout, therefore, complies very well with the requirement that it conform to the usual accepted speed for a medium-speed signal indication.

The No. 14 turnout permits speeds of 34 mph. This speed is a little low for these medium-speed movements.

Why five basic turnouts? cont'd

Predominant diverging-train movements would be at the maximum allowable speed and the cost of maintenance, where all trains operate at maximum speed through the turnout, is much higher than where trains are operated at speeds somewhat below the maximum.

The allowable speed for the No. 16 turnout is 40 mph, or only 2 mph greater than for the No. 15. The cost of the No. 16 is greater than for the No. 15 and the limited advantage of the No. 16 over the No. 15 does not justify the additional expense.

For any program of standardization to be successful, it must be easy for the majority of roads to adopt. The committee determined that more roads were using No. 15 turnouts at the present time than were using either No. 14 or No. 16 turnouts. The No. 15 turnout could be adopted by the American railroads as standard with much less trouble and expense than would be involved in the selection of either of the other two turnouts. This was another factor that indicated the No. 15 turnout as the logical choice for a standard medium-speed turnout.

Justifies curved points

Moderator: Well, why recommend curved switch points and not straight points for the No. 15 and 20 turnouts?

Klingel: The No. 15 and No. 20 turnouts are the medium-speed and the high-speed turnouts. Maximum allowable speed is the primary consideration in selecting these turnouts. The use of curved switch points permits operation at higher speeds than straight points; provides a better alinement for the diverging route and, threfore, a smoother ride; requires less maintenance because of the better alinement; and requires a shorter lead distance, which offsets in part the additional cost of the curved switch. The committee is of the opinion that the additional cost is justified by the advantages in operation and maintenance, where maximum speed is such an important factor.

Moderator: Why No. 6 and No. 8 turnouts for yards?

Klingel: Maximum speed is not a primary consideration in the selection of turnouts for yard work. Here, the problem is to select turnouts that can be operated over at normal switching speeds; have a reasonably short distance between the headblock and the clearance point so as to provide maximum track capacity with minimum cost; and are not so abrupt as to require excessive maintenance.

The No. 8 turnout is used extensively at the present time and the curvature, which was considered objectionable by some roads for operation with steam locomotives, is no longer a problem with diesel locomotives. The length of lead is only 68 ft, which will permit good track capacity. Sharper turnouts would be more difficult to maintain. Longer turnouts would be more expensive and would reduce track capacity unnecessarily. The No. 8 turnout is, therefore, recommended for all typical locations for yard and switch movements at slow speeds.

Occasionally, other factors may dictate the location of the switch or the alinement of the track so as to make a sharper turnout necessary, the use of a No. 8 turnout being impossible or impractical. For these locations, the use of a No. 6 turnout is recommended. The No. 5 turnout is so sharp as to be impracticable unless absolutely necessary. Such occasions are not frequent enough to justify an industry wide standard.

Moderator: Mr. Creedle, why are graduated risers recommended instead of uniform risers for the switches?

Creedle: Well, the cost of a complete switch with graduated risers is less than the cost with uniform risers. This is due mainly to the use of hook-twin tie plates instead of the run-off plates at the heel of the switch. Also, in the case of a rigid heel block, the same block can be used for both right-hand and left-hand with the graduated risers, due to being level at the heel. That is a factor in direct expense as well as storage expense.

The graduated risers actually are more generally used throughout the country than the uniform risers. If you want to have a plate at the heel of the switch similar to the run-off plate, that can be obtained. This would bring the costs of the two switches very nearly together.

Moderator: Why recommend undercut stock rails for curved switches and the conventional point for straight switches? Mr. Klingel I believe you can answer that one.

Klingel: Curved switch points are bent so as to be parallel to the stock rail at the point. Undercutting the stock rail permits making the switch point thicker and stronger at the point than would otherwise be possible. The undercut stock rail is more expensive but the increased life of the curved switch point more than justifies the additional cost.

Straight switch points, which meet the stock rail at an angle, can be tapered sufficiently to provide adequate strength without undercutting the stock rail. Consequently, the ¼-in point with the conventional stock rail is recommended as being more economical for the straight switches.

Moderator: Mr. Zeeman, why a fully bolted heelblock instead of the so-called floating heel?

Zeeman: The committee recommends a fully bolted heelblock assembly, including shoulder bolts, because it makes a stronger heel joint. Also, it reduces maintenance expense in maintaining proper switch-point clearance by its rigidity. Present-day improved rail anchorage has largely eliminated former objections to the rigid heel-joint assembly.

Moderator: Why are flat switch rods recommended, Mr. Creedle?

Creedle: Well, the present AREA plans do not have a vertical rod. The committee felt that the side jaw-clip would be suitable for most of the locations and the greatest number of switches. This would require the use of a flat rod.

It ought to be pointed out, however, that the vertical rod is extensively used in this country on power-operated switches. I don't see any objection for anyone to order a vertical rod, if they wish to do so, and I don't see how it would adversely affect the standardization program.

Moderator: Mr. Klingel, why not use adjustable rail braces on all switches?

Klingel: Adjustable rail braces make it possible to maintain very close tolerance on the fit of the switch points and on the track gage. But they are more expensive, consist of more parts, which complicates installation and maintenance, and require frequent in-

"For any program of standardization to be successful it

spections to maintain the required fit and to keep the bolts tight. For these reasons, it was not considered either necessary or desirable to adopt adjustable rail braces on switches for yard and switch-track use.

Why drop 60-ft stock rail?

Moderator: Mr. Creedle, why abandon the use of 60-ft stock rails in favor of 39-ft switch points?

Creedle: Well, the 39-ft stock rail has been used successfully for a number of years with the 39-ft switch point. The principal reason for abandoning the 60-ft stock rail is the great difference in the total cost between the two. This would include not only a much higher cost for fabrication and shipment, as well as for installation and repairs, but also the higher initial cost of the rail from the mill. Also, you would have some higher cost in handling if this rail were welded at your own welding plant, because you would still have to undercut the rail and incur the machining and handling costs to and from the plant.

Moderator: Why have both rigid and spring frogs for No. 10 main-line turnouts, Mr. Zeeman?

Zeeman: These two designs cannot be called alternates. Each type is designed for a particular use, largely determined by conditions as well as methods of train operation, and whether the traffic is predominantly over the main track or is more nearly equally divided. In the spring-rail frog, the long spring-rail design is preferred because its length is interchangeable with the railbound manganese frog.

Moderator: Why offer selfguarded and railbound manganese frogs for Nos. 6 and 8 turnouts and not include bolted frogs?

Zeeman: This recommendation is based strictly on economy. While some roads are using bolted-rail frogs because of lower first cost or light traffic, it is believed that the types of frogs recommended, while the first cost is greater, will prove more economical on an annual cost basis, due to longer life and lower maintenance cost.

Moderator: Mr. Zeeman, what was the response of the Track committee at the time this proposal was offered for vote?

Zeeman: I might say that at the last Track Committee meeting, the recommendations as submitted, after considerable discussion, were approved unanimously by a verbal vote. However, the response to the letter ballot was a little different. Out of 41 members voting, 34 members approved the recommendations 100 per cent, 6 members approved them partially, and one member disapproved them completely.

"To secure the maximum benefits of standardization, it was necessary to select the minimum number of turnouts that would fulfill the requirements for all typical locations."—*T. R. Klingel*

"In fact, it seems to me that manufacturers might reduce prices of turnout material more than five per cent if the railroad industry adopts and uses these recommended turnouts."—*M. C. Bitner*

"The cost of a complete switch with graduated risers is less than the cost with uniform risers. . . . The graduated risers actually are more generally used throughout the country than the uniform risers."—*F. W. Creedle*

"The committee recommends a fully bolted heel-block assembly, including shoulder bolts, because it makes a stronger heel joint."—*M. J. Zeeman*

Manufacturers will lower price

Moderator: Mr. Bitner, what reduction in cost can be anticipated when these plans are generally adopted and used?

Bitner: If the recommended turnouts are generally adopted and used by the railroads, the price of the switches and frogs will be reduced about 5 per cent by the manufacturers.

In a survey made in 1956, the manufacturers estimated a 3-per cent to 5-per cent or more reduction in cost if one-half to two-thirds of their turnout production consisted of a single length and design of switch and a single angle and design of frog for yard use, one for main-track slow speed, one for medium speed, and one for high speed.

This report is found on page 959 of the 1957 AREA Proceedings. The AREA Trackwork Plans contain plans for 13 turnouts, 59 frogs and 8 switches, with 36 possible alternates for each switch, depending upon the type of plates, braces, heelblocks, clips, etc., that are used. These recommended turnouts will reduce the number of turnouts from 13 to 5, the frogs from 59 to 8, and the switches from 8 to 4, with no alternates for the switches.

Manufacturing costs will surely be lowered by this tremendous reduction in the number of different designs of frogs and switches. In fact, it seems to me that manufacturers might reduce prices of turnout material more than 5 per cent if the railroad industry adopts and uses these recommended turnouts.

Moderator: Gentlemen, our time is limited but I believe we have enough time left for a few questions from the floor. We would like to hear your questions. We'll do our best to answer them.

President F. R. Woolford (WP): Speak up, gentlemen. I know you all don't agree. From the floor I would argue on the curved switch points. I don't think they are too practical for all railroads. There are a lot of points to argue, so speak up.

Different plans for various rails

D. L. Jerman (P&WV): I understand your proposed standardization is based on five turnout designs. Can you justify five turnout designs with approximately 30 rail sections?

Zeeman: Unfortunately, we have no jurisdiction to limit the rail sections. We would like to do it. Naturally, if we have 30 rail sections, as you say—there are only 6 in the Manual that are recommended now—we have 30 times the five designs. By that I mean, if there is enough difference in the rail

must be easy for the majority of roads to adopt." *T. R. Klingel*

Why five basic turnouts? cont'd

base, you have to use a different turnout plan. That is one thing. But, if several of the 30 sections have the same rail base and the same width at the head so you can maintain the same gage and keep the tie plates where they are, you will have a lesser number of turnout plans. But you will still have plans for 30 sets of switches in the different lengths. In other words, the five turnouts recommended would cover one rail section. If you have six rail sections, you would have to multiply that by six. Is that what you are suggesting?

Jerman: Do the manufacturers still propose a 10-per cent reduction?

Bitner: I didn't say 10 per cent. I said 5. Actually, when this question was asked in 1956, the manufacturers were asked the per cent reduction in cost of frogs, switches and guard rails of existing rail sections, a single-length design, etc. So at that time I was talking about the existing rail sections.

Moderator: Are there any other questions, gentlemen?

Member: I would like to ask why, when choosing your yard turnouts for restricted speed, you stopped at a No. 6 and didn't go a step further to the No. 5. It will still give you the curvature you are interested in.

Klingel: The sharper the turnout, the more expensive the maintenance and the more difficult the maintenance will be of that turnout. With these sharp turnouts, the No. 6 would have very limited application, only where it was absolutely necessary and where it was impossible to use the recommended No. 8 yard turnout. It was the opinion of the committee that the No. 6 turnout would fulfill the requirements for by far the majority of these special locations.

There may be, in fact, probably will be certain locations some place in the country where some road will require the sharper turnout, the No. 5, or even a No. 4½. But those turnouts could be secured as special trackwork, constructed for that purpose, and the benefits of standardization would not accrue to those special locations.

SETTLED and disintegrated stones weakened the earth-retaining ability of the wall.

Failing stone wall is . . .

WEAK spots were filled with spalls and grout injected to bind the courses together.

. . . reconditioned by grouting

● The bridge and building department of the Monon recently restored a failing stone wall to a safe embankment-retaining condition.

Located at Roachdale, Ind., on the road's main line between Chicago and Louisville, Ky., the wall retains the embankment on one side of the track. It is 400 ft long and is composed of several courses of limestone blocks, laid dry.

At the middle of the wall is a 12-ft by 12-ft by 50-ft rail-top stone box culvert. The wall continues over one end of the culvert to serve as its headwall. Over the years some of the blocks had settled and disintegrated to such an extent that repairs were necessary.

It was decided that the best way to restore the wall to a safe condition was to fill the weak spots with spalls and then inject grout to bind the courses together.

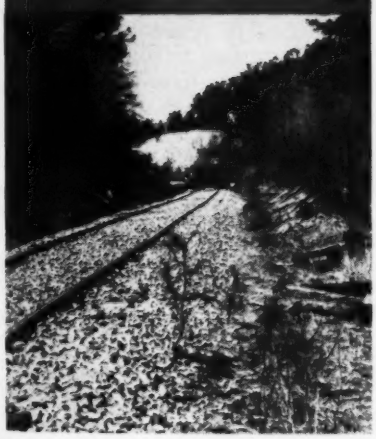
Spalls for the job were obtained from the waste of stone mills. Grout was injected by means of a Bondactor concrete gun, filling all voids from depth of stone to surface of wall. Water was applied at the nozzle of the concrete gun and was heated to permit grouting at below-freezing temperatures.

Total cost of the job was $1,000, including the labor of six men for seven days.

The work was carried out under the general direction of M. P. Anderson, chief engineer. A. B. Wang, supervisor bridges and buildings, supervised the project.

MAIN tracks look like this before being rebuilt. Ballast is sand, tie condition is poor. Speeds are restricted.

TRACK is stripped of sand ballast, ties are renewed and rock ballast distributed, for 6-in initial raise.



G & F rebuilding tracks with ICC-approved loan

The Georgia & Florida, a 320-mile line, has the distinction of being the first railroad to be awarded a loan for track rehabilitation under the Transportation Act of 1958. The amount: $1 million. It's being used to carry out a program in which about 182 miles of track will be rebuilt. Loan covers materials and machines only; labor and supplies come out of operating funds.

By **Stewart B. Austin**, chief engineer, Georgia & Florida

● Track gangs of the Georgia & Florida are now hard at work on an extensive track-rehabilitation program. The work itself has some interesting aspects but the most interesting phase of the program is the manner in which it is being financed.

Source of the money to carry out the work is a $1 million loan approved by the Interstate Commerce Commission under provisions of the Transportation Act of 1958. The loan, guaranteed by the federal government, is the first of its type and will be used in a main-track rehabilitation program in which about 182 miles of track will be partially rebuilt. Work began in March, and is scheduled to be completed in the Fall of 1961.

(In 1959 the ICC also approved a loan of $1 million to the G&F for the purchase of a hundred 50-ft box cars, delivery of which was made last fall.)

Application for the track-rehabilitation loan was made early in 1959. Before a decision was made regarding it a thorough study of the road was made by the commission's staff. ICC representatives inspected the entire property which is a 320-mile line extending from Greenwood, S.C., to Valdosta, Ga. Alfred W. Jones is receiver. Particular attention was given to the track and structures, but studies were also made of the personnel, labor relations, patrons both on and off line, present and potential industrial locations and general prospects. It can be said that approval of the loan was a vote of confidence in the road.

In past years the G&F had been

Old sand ballast, weeds are removed, ties renewed, respaced

1 Two-Wheel Kribbers remove as much old ballast as possible. Track Broom then cleans sand, weeds from ties.

2 Using Kershaw Track Jack the track is raised to allow ties to be knocked down. Man in foreground is author.

G & F rebuilding tracks cont'd

able to maintain its main track satisfactorily on sand ballast. Such track, however, requires greater outlays of labor than other types of ballasted track. For this reason, and because of increased axle weights, higher labor costs and the fact that sand ballast does not lend itself to mechanized maintenance, a program was started in 1955 to retimber and ballast the road with crushed rock.

In carrying out this work it was desired first to remove all sand or native soils from the track. Since few machines were available that could remove sand ballast the road collaborated with the Kershaw Manufacturing Company in devising a system whereby that company's machines, modified to meet the requirements, were able to do the job in a satisfactory manner.

During the period 1955-56 about 90 miles of main track were rebuilt. However, in 1957-58 it was necessary, in common with other roads, to curtail the track program. Going into 1959 the road had 110 miles of main tracks, plus yards, which had been reworked and placed on a mechanized maintenance base.

But much work remained to be done. Loads on the track were continuing to increase and operations were hampered by speed restrictions due to rough tracks brought about by wet weather. Also there was a need to place all maintenance on a mechanized cycle basis. It was for these reasons that the management of the road made the decision to apply for a government-guaranteed loan to complete the job of rehabilitating the main tracks.

Track is upgraded with rock ballast, then raised, surfaced and lined

SURFACING follows immediately after distribution of crushed rock ballast. Track is raised with Kershaw Tamping Jack.

On being notified the loan would be granted steps were taken to provide the necessary materials and the additional machines and equipment needed to increase the work force. By March a gang to carry out the track rehabilitation work had been organized and its machinery had been brought up to date by additional purchases. At present the gang consists of 15 machine operators, foremen and assistants, and 28 laborers and cooks. It is in charge of a supervisor of track—mechanized gangs, and is housed in camp cars.

Ahead of the track-rehabilitation gang the roadbed is prepared for ballasting by running a Jordan spreader over the line, followed by a ditching work train setting back cuts and flushing fills. Section forces then distribute new ties and tie plates, remove anti-creepers and do other work.

Basically the job of the track-rehabilitation gang is to remove all sand ballast, retimber and tie-plate the track, add crushed rock ballast and bring the track to line and surface. The materials available, on the average, consist of 1,100 treated hardwood ties and 1,500 tons of ballast per mile for a first raise, plus tie plates, spikes and other materials.

The work of the track-rehabilitation gang is complicated by the large number of tie renewals, the difficulties of stripping weed-covered track, and the need to have the track ready for use by trains on short notice. At the same time there is a pressing need for speed and economy.

To meet our schedule we have to rework approximately ten miles of track per month, which is a considerable undertaking for a road of this size. A consideration calling for economy is the fact that the proceeds of the loan are to be used only for materials and machines, with the cost of labor and supplies to come out of operating funds. Under these conditions we have to have an efficient organization.

The equipment and procedure we use in stripping and retimbering the track are as follows:

How track is stripped, rebuilt

3 Two Kershaw tie-bed cleaners complete the job of cleaning ballast from cribs. They also space the ties.

4 After laborers, using shovels, remove remaining sand and gravel from the track a Ballast Regulator smooths the track shoulders.

TRACK JACKS are used to pull out small irregularities in surface, then track is tamped by two Jackson tampers working in tandem.

TRACK is lined by Nordberg Trakliner. Gang has been equipped with radios for intra-gang use and communication with trains.

As much material as possible is exhausted from the cribs, using Kershaw Two-wheel Kribbers. Sand and grass are swept from the tops of the ties into the cribs by a Kershaw Track Broom. A Kershaw Track Jack is then used to raise the track a sufficient amount to allow laborers to remove ties, using spike bars to knock them down. To avoid over-humping the track and to assist in disposing of sand the track is given a raise of 2 to 4 in while elevated by the jack.

Next in line are two Kershaw Tiebed Cleaners and Tie Removers, although we do not use the tie-removing feature excepting when we run into previously ballasted track requiring timber. The cleaners remove the sand from the cribs, particularly under the rails; also space the ties.

Laborers make a final sweep of the track with shovels, leaving it completely cleaned of sand and grass. A Ballast Regulator then smooths up the sand deposited outside the ties and shapes up the shoulders. Tie insertion is the next operation and for this we use the Kershaw Track Crane with tie inserter. Next, laborers install tie plates, gage the track and set spikes which are driven by I-R pneumatic spiking hammers.

Since we have to restrict train speeds to 5 mph over stripped track we distribute ballast and surface the track as soon as possible. Crushed rock ballast is distributed by work trains in cuts of 25 to 30 cars, and surfacing follows immediately.

The ballast section we use will allow a raise up to 6 in. However, we generally reserve enough ballast to allow a 1 to 2-in smoothing raise after the ballast has settled under traffic.

Our surfacing operation, while not the last word in methods, does suit out particular needs. The equipment and procedure used in this operation are shown by the photos at the top of these pages. Not shown is a Ballast Regulator which is kept with the gang to regulate ballast before and after tamping in conjunction with a track broom. Regular section forces dispose of the old ties, apply anti-creepers and otherwise clean up.

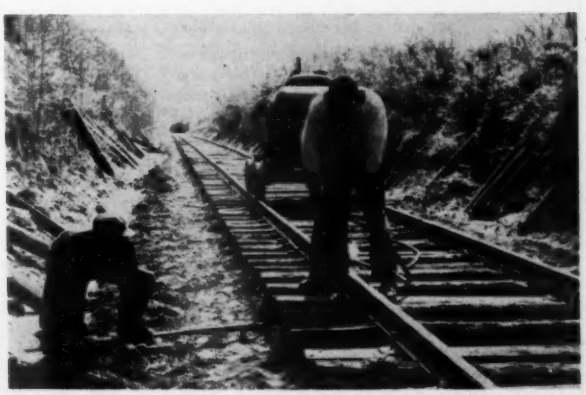
We are now in the process of equipping the mechanized gang with radios so that the parts of the gang will be in touch with each other. Since our road has two-way Motorola radio base stations for communication with radio-equipped road locomotives, the gang will also be able to communicate with the base stations and trains.

One or two roadway mechanics, equipped with rolling shop trucks, are assigned to the maintenance of the machines used by the gang.

During the period 1960-61 we plan an extensive trestle repair program among other projects so that, at the end of our program, the road will be in the best shape since it was constructed. We do not plan on any extensive rail renewals during this period, as it is first necessary that we place the basic track structure in shape to support new rail.

We are highly confident that our work will see a new railroad emerge from the old one. Led by an aggressive operating management, headed by Chief Executive Officer J. P. Belvin, we expect to attract more business and to be able to handle it.

5 New ties are inserted with Kershaw Track Crane. Schedule calls for reworking of approximately ten miles of track per month.



6 Tie plates are inserted, track is gaged and spikes are set, then driven by I-R pneumatic spike hammers.

What does a career in M/W work

"If a bright young man were to ask your advice about whether or not he should adopt railroad maintenance-of-way work as a career, what would you tell him?" This question was recently posed by our "What's the Answer?" editor. Replies were scheduled to be published in the March issue. But so many were received they could not all be printed in that number. Here are the remainder.

More opportunities available

By W. A. SCHUBERT
Division Engineer
St. Louis-San Francisco
Chaffee, Mo.

I would tell this young man that a job in maintenance-of-way is good work and commands a good salary. I would also explain the contractual benefits, such as seniority rights, vacation rights, hospitalization for himself and his family, should he have one, pass rights and many other benefits usually not equaled in other industries.

I would tell him that chances for promotion to a supervisor are greater at this time than it has been for years. I would tell him that maintenance-of-way is fascinating and gets into one's blood, providing he gets into his work enthusiastically.

I would tell him that any young man showing the right attitude will be helped by his supervisors. They will be interested in him because they all realize that it is later than we think when we consider replacements available in our remaining maintenance force. For the most part, the latter has dwindled to a group of men over age for promotion and who do not care to take on added responsibility. A recent check I made on our railroad showed that the average age of the working foreman is 57.9 years and the average age of laborers is 52.1 years. Obviously, in just a short time, we will need young and bright men to fill vacancies that will occur due to elimination by reason of age or infirmities.

I would tell him that railroading is not all honey and pie, since he will be subject to call day or night and regardless of weather. The work is hard, but hard work does not hurt anyone.

I would tell him that his superiors will watch him and, if he performs his duties well, his chance for promotion is good. By the figures mentioned concerning the average age of our remaining forces, I can prove to him that, if he shows aptitude, his chances are good to become a supervisor in a comparatively short time. I would remind him that he should make every effort to improve himself, by doing always just a little more than is required of

Wants to correct 'false impression'

TO THE EDITOR:

In reply to the question on advice to a "bright young man," an interesting answer from a section foreman was given on page 88 of the March 1960 issue of *Railway Track and Structures*. It deserves an answer because the letter does not contain facts and it should be called to the attention of the readers to avoid spreading a false impression.

The writer of the letter, however, is to be commended for his frankness. However, had he given his answer more study it perhaps would have been written in a different light.

So the writer may understand my thoughts, may I say that I have traveled the same road he has, starting as a section laborer 44 years ago and being advanced progressively to division engineer, from which position I retired in February of this year. This was accomplished without a college or university degree, although I wished many times I had this additional technical knowledge. My comments, therefore, are not biased, but originate from personal experiences.

Not knowing the background of the writer, I can only reply in generalities. The facts are:

Chances for a bright young man in the track department were never better, as is indicated by a number of other replies.

The pay is not "very low" and "lowest" of any industry. The pay of a section laborer is:

- Hourly rate of $2.004 for a 40-hr week, plus time and one-half and double time after 8 hrs., depending on the number of hours worked.
- Seven paid holidays per year.
- Hospital benefits for which the largest portion of the dues is paid by the company.
- Hospital benefits for his family, all paid for by his company.
- Sick benefits paid for in part by his company.
- Pass rights for him and his dependents.
- Three weeks vacation with pay.
- Railroad retirement, the largest portion of this being paid for by his company.

In 1914, this same laborer received 11½ cents per hour, and worked 10 hours per day, 6 days per week with no overtime pay, except on call. He went to work on the company's time and returned at the end of the day on his own time from the location where worked. He did not receive pay for holidays. He paid hospital dues without support from the company. His family did not receive free hospitalization. He did not get a paid vacation. He was not paid when he was off duty on account of sickness. Only on some railroads was he assured a pension, which was very limited.

The pay of a section foreman is $413.50 per month, with the same benefits a laborer now receives. In 1914, his salary was $50.00 per month.

The pay of a roadmaster is $680.00 per month, compared to $125.00 per month in 1914.

These pay scales differ slightly on some roads. But they serve as a comparison and will show that the trackman is not a low-paid employee and certainly not the lowest in any industry as the writer claims.

I would suggest the writer make a survey to find out what salaries are paid to various people in his community. For instance, he should question bank employees, department store employees, filling-station attendants, and men in many other industries which continue paying the minimum $1.00 per hour as the basic-wage scale. He might even contact his pastor and compare the wages of that profession with his. He will be astonished.

To continue, what is wrong with "hard manual and physical" labor? What is wrong with getting dirty while doing good, honest work? Clean work is for the so-called "white-collar" group, who in many cases get less pay though having a better education than the section foreman. The writer should ask some school teacher about his salary, who has to teach nine months a year and gets nine months pay, but still has to

offer for the bright young man?

him, and to not hesitate in calling on his immediate supervisor for an explanation as to the hows and whys of doing work. I would suggest that he even take a correspondence course.

To the supervisory personnel, I would say that it is to their advantage to contact school authorities. Through them locate some bright young men, who for financial reasons cannot attend college and therefore might take any kind of a job and pass up the opportunity for work on the railroads. Such work might prove desirable to them when they are told more about its nature. I think we are failing to realize the importance of getting young men to accept jobs in maintenance of way as a career.

Once a young man has been chosen, I would call him to the office and talk to him in a frank manner. I would tell him what is ahead of him and what he can expect. For a supervisor's position I would be more choosey and not hire any one just to fill a vacancy.

Most supervisors have accepted present conditions as a matter of no concern to them. With defeatism they claim that the seniority rule prevents or hampers them in selecting the right young men. My study shows that, of the force now working, we cannot get a man to accept promotion. Therefore, any young man accepting work in maintenance of way should be ripe in two years to fill vacancies in the supervisory rank. Men younger than the ages given in our study are not available in our forces any more. They have placed themselves elsewhere, after force reductions made necessary in the past few years by the constant rise in wages and increased cost of materials. But the remaining force is now stabilized to the extent that there is room for new men of the type I would employ in the future.

The seniority rule, as important as it is, will not hinder us from starting to fill vacancies with bright young men. When a young man has acquired sufficient knowledge in maintenance-of-way work and a vacancy for a supervisor occurs, he will then have little opposition from older men by bidding rights. As stated previously, the older men do not desire promotion. Consequently, he has an open field. With compliance of our labor contracts, upon which promotion is based and are worded "seniority to be sufficient, but ability and merit to be prevailing," we can build up our organization with good available timber to fill vacancies which are sure to come more rapidly in the next two or three years.

Must have education

By J. H. BECKER
Foreman (Ret.)
St. Louis-San Francisco
Festus, Mo.

I would tell the young man to go to school and learn all he could about engineering. If he were to start in the maintenance department as a laborer, that is just about as far as he will ever get today. It is not like when I started on the road. In those days a man could work up to be a roadmaster. But that day seems to be gone regardless of his ability to handle the job.

(Please turn the page)

live the balance of the year and in many cases is compelled to take post-graduate work.

The responsibility of maintaining a safe track and taking on additional duties as a foreman requires several years of good training, depending, of course, on the aptitude of the individual. Promotions are slowed by contract agreement and the seniority rule, which reads "seniority to be sufficient, but ability and merit to be prevailing." The organizations demand that seniority must be given preference.

The fact that in many cases machine operators are paid a higher wage than the foreman is also a contract arrangement. This, however, is not confined to the railroads alone. In most industries, the specialist receives more pay than his supervisor.

Camp-car conditions are being constantly improved and railroads should be commended on the efforts they are making along that line. Most camp cars are converted tourist Pullman cars, equipped with electric lights, fans and other conveniences —a long cry from the camp cars of years ago. As for not having his family along, this situation is not confined to railroads. However, many employees are overcoming this handicap by acquiring their own trailers.

The higher echelon of railway officers is constantly on the lookout for the type of foreman who is not satisfied with simply maintaining his track but who works constantly to improve it by applying the proper initiative and not waiting to be told every move to make. It is true that the number of higher positions is reduced as they are upgraded. But the writer of the letter has the wrong impression when he states that the "very lucky one" is the one who wins promotion, instead of the one showing best qualifications and readiness to take on added responsibility.

To remain a roadmaster until retirement certainly is not a disgrace. The promotion to roadmaster in the beginning is a mark of high practical knowledge and a reward of good and loyal work as section foreman. His retirement brings him a good pension, coupled with other benefits, and many individuals are envious of his position at retirement. I do not know of a single roadmaster who ever regretted his position at time of retirement. I would not consider the position of roadmaster and assistant trainmaster minor positions and underpaid. Compared with salaries in other fields they are similar and in many instances better.

In the end, the letter from this foreman should be read by every supervisor to find out what prompted the writer to present his thoughts in the manner in which they were brought out. Did his immediate supervisor fail to recognize the ability of this foreman? If so, and if this foreman was capable of accepting greater responsibilities, did his supervisor bring this fact to the attention of his superiors? I have known cases where capable men did not advance because of selfish reasons on the part of their supervisors, who were afraid of disrupting their organizations.

Did this foreman, after his promotion to that position, take it for granted that promotion is automatic and all he had to do was to wait until it was handed to him? Next, did he like his job as foreman? If so, it would stimulate a greater interest in his work. Also, did he take some correspondence courses, which are available to trackmen who desire to better themselves, and thus show his supervisor that he wanted to get ahead in life.

Something happened in this case. A supervisor has a great responsibility in recognizing the potential in a bright young man. Such recognition will not only help the man, but will also help the supervisor build up his organization.

Certainly, as a young man, I would rather go to work as a section laborer and get my hands dirty with the promise of advancement for work well done than to take a job where machines take over and the man remains frozen, until he becomes virtually a robot, without the challenges that are afforded in track work.

W. A. Schubert
Division Engineer (Ret.)
Frisco Lines
Chaffee, Mo.

Career in M/W work cont'd

As long as I have been employed in maintenance, it is my experience that railroads pick most of the men for roadmaster's job from those who have been trained in the engineering department. So I say to all young men, go to school, get a good education and work up in the engineering department. Also, learn all about the new methods in this field of work as this is what all railroads want. Get away from the old system of railroading.

Seniority is a hurdle

By George Yaros
Trackman
Baltimore & Ohio
Bradford, Pa.

I would tell him "no." I say this because there isn't a very good chance of moving up, except maybe to section foreman or extra-gang foreman. After all, these positions aren't very good compared to other industries, where you may expect promotions that amount to better than foreman, with more money, less responsibility, and better working conditions, such as the elements.

With seniority being such a big factor for promotion on railroads, you first have to have many years of service, in most cases, except possibly for getting promoted to a supervisor or higher. These opportunities are few and far between.

There are a lot of men working in section and extra gangs who could be promoted. But, because of seniority, they don't have much of a chance. This might happen to your young man. There are also a lot of men working who could be promoted to supervisor with a little instruction from higher supervision. Unfortunately, there are not enough positions to warrant this. If he had a college degree, he would not come out to work on section or extra gangs, only perhaps in the summer when school was out or on vacations. The way employment is today, we don't get many school kids during vacations like we used to.

The way things are, you have to put in time before you get a promotion and, if you and an older man bid for a position, the older man with seniority gets the position. So why work for less wages than any other department of the railroad, when, if he is a bright young man, he could get into one of the other better-paying departments. I would tell him that men have been in the railroad M/W department with 10 to 20 years experience and haven't had a chance for promotion, due to seniority.

If he were a bright young man he could go anywhere and get a much better job. I would tell him about other track men who could. I would tell him of the experienced men who could be promoted but never had the chance because they didn't have enough seniority. I would tell him that if the railroad wanted to promote men to higher positions, they should start schools for men they have in the M/W department so that some of them, with years of faithful service, could be rewarded with a promotion.

I would also tell him that, if he could start right out as a supervisor, he would be getting a good job. But that possibility isn't very likely.

Many reasons why he should

By M. D. Kenyon
Track Supervisor
Denver & Rio Grande Western
Kremmling, Colo.

Here are some reasons why a recent college graduate chose railroading as a career:

He first evaluated the industry as a whole. What were its growth prospects? In the United States railroading has reached the status of a mature industry. The rampant growth characteristics at the beginning of this century no longer exist. Rather, the industry's potential now assumes an internal pattern — improvements in efficiency of operations and service through technology advanced by "non-traditional" thinking. Here is an area appealing to the young man with new ideas.

Next, he considered his interests and background. Maintenance-of-way work fits right in line with his previous training—civil engineering. This work affords a variety of stimulating engineering problems in structures, soils, materials, and construction. Also, it is an excellent opportunity to work outside rather than behind a desk. Many dislike the confinement of an office.

Finally, he looked for a career that promised increased responsibilities as he gained experience. Maintenance-of-way work is an area where there is every indication of increasing opportunities. At present railroads are below the national industrial percentage of supervisors per capital of labor force. The industry is awakening to the fact that this percentage must be increased for better efficiency. More experienced supervisors will be needed from the ground up.

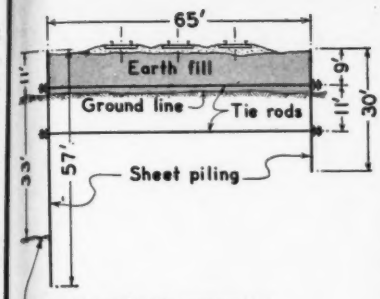
Good reading is essential

By B. E. Cors
Assistant Engineer of Track
Central District
Chicago, Burlington & Quincy
Galesburg, Ill.

I would advise him that there exists a greater future in M/W work today than at any other period within the past 50 years. I base this on the fact that the larger percentage of maintenance-of-way people today were employed during the depression years or shortly thereafter. I believe the excellent condition of our railroads has been perpetuated more by these people than any other factor, because this period afforded an opportunity to separate the people with more ability and determination from the individuals with lesser amounts of these faculties. Time is fast running out for these people and they will have to be replaced shortly.

It would be pointed out to him that, for him to fully understand and grow with this career, an individual must have or develop good reading habits and be a good listener. These two things are prime requisites more than any other equipment a person may possess to enable one to continue a successful career in railroading. I say "railroading" because 80 per cent of maintenance of way is on-the-job training.

These two faculties will enable one to grasp methods of handling the various tasks assigned to him. Being a good reader, regardless of the subject, will give him the ability to segregate the good and proper procedures comprehensively. This is more necessary today than ever before because of limited expenditures and higher prices. Being well informed on various methods and of the machinery being developed today, will allow the individual to accomplish the tasks before him by the best means available.



Maximum depth excavation for grade-separation bridges

SHEET-PILE and tie-rod construction of shoo-fly (above) was required because of need to excavate for three-level grade separation (right).

Fill between sheet-pile walls . . .

. . . Carries long, 3-track shoo-fly

Embankment with vertical side walls and no exterior bracing was dictated by need for temporary station and passenger platforms at track level and requirement that width be kept to minimum.

● Under ordinary circumstances a 2000-ft shoo-fly to carry three tracks would doubtless be built as a trestle.

But circumstances were far from ordinary when it became necessary to construct a bypass line of this length to carry the North Western's three-track Wisconsin subdivision in Chicago.

Here's the situation:

In connection with construction of the Northwest Expressway a three-level grade-separation structure is required at the intersection of the railroad, the expressway and Milwaukee avenue. During construction of the grade-separation it was necessary to provide a temporary structure on a curved alinement to carry the tracks around the site. Design of the bypass structure was influenced by these two primary considerations:

(1) The need for providing a temporary passenger station and platforms on the structure for the use of passengers ordinarily using the Jefferson Park station.

(2) The necessity of adopting a type of construction that would encroach as little as possible on the construction site of the grade-separation structure.

To satisfy these requirements it was decided to build a temporary structure consisting of two lines of sheet piling tied together with steel rods and with the space between filled with compacted earth. In effect, therefore, the resulting structure is an embankment with vertical side slopes and with no bracing protruding outside the faces of the piling.

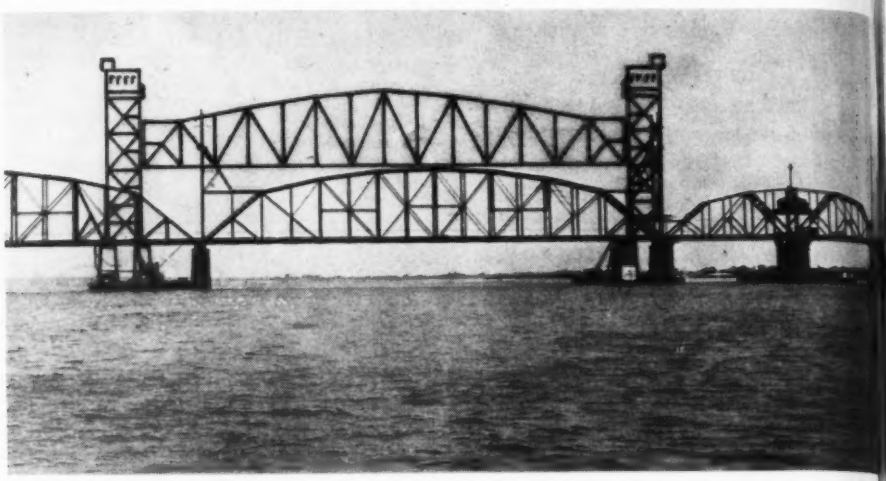
The two lines of piling, which was furnished on a rental basis by the L. B. Foster Company, are 65 ft apart. Because considerable excavation was required on the side where the grade-separation structures are being built, the wall of piling on this side had to be driven much deeper than the outer one. MZ-38 sheets 57 ft long were driven to an average penetration of about 46 ft along the inner wall, while MZ-27 sheets 30 ft long were sufficient for the outer line of piling.

In driving the piling, the contractor —the Robert R. Anderson Company —set it up in straight panels by means of a steel templet about 30 ft long. To form the curvature required by that of the tracks the panels were driven as a series of chords.

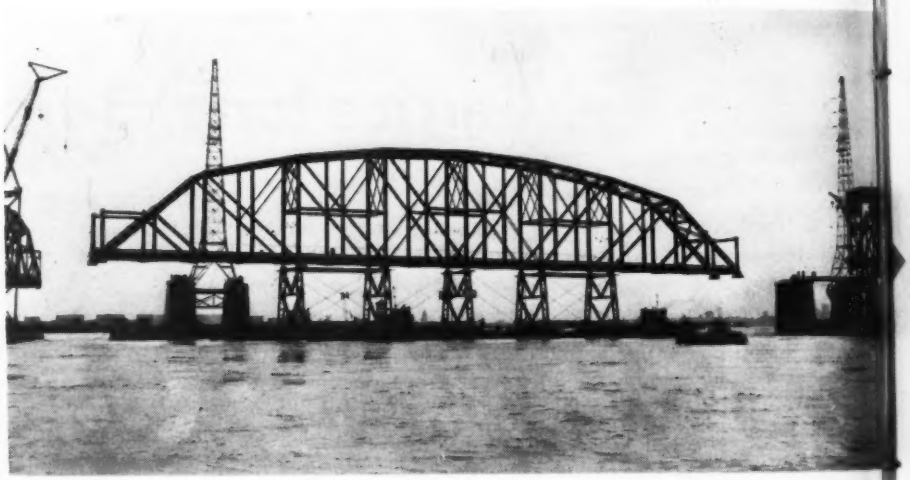
The walls of sheet piling are tied together with tie rods placed at two levels. The upper level is located about 9 ft below the tops of the sheets. It consists of 2 ⅜-in round rods spaced 9 ft 9 in apart. Waling outside the walls on the line of these rods consists of 15-in 34-lb double channels. The lower level of tie rods, about 11 ft below the first, consists of 3½-in rods spaced 9 ft 9 in apart and with wales of double 18-in 58-lb channels. Since the rods at this level were below the existing ground level trenching was necessary when installing them.

With the walls in place the space between them was filled with earth placed by dump trucks and compacted by rollers. The fill material was obtained largely from adjacent excavation in connection with construction of the triple-level grade-separation complex. This excavation was carried to a maximum depth of about 33 ft along the inside wall of sheet piling.

Tidewater helps position 542-ft lift



Long vertical-lift span will give wider opening at new 400-ft channel



Old fixed truss was lifted off piers by rising tide and floated to shore

New lift span was erected on barges, floated to site, lowered by ebb tide

lift span for PRR's Delair bridge

Retouched photograph at the left shows how a portion of the Pennsylvania's Delair bridge across the Delaware river at Philadelphia will look after a current project to install a 542-ft vertical-lift span is completed.

On March 19, after three years of preparatory work, the new vertical-lift span was installed on the site of an existing 533-ft fixed span. The towers are yet to be built.

Changes in the bridge are required in connection with a project, initiated by the Army Corps of Engineers, to improve navigation in the river.

These improvements call for a channel 500 ft wide (with an initial width of 400 ft); the shifting of the channel 500 ft to one side of the existing channel to eliminate a curve; the deepening of the channel to 40 ft at mean low water; and minimum overhead clearance of 135 ft above mean high water.

To put these improvements into effect major alterations are required in the Delair bridge which carries a double-track line of the PRR across the river between Philadelphia and Camden, N. J. This bridge, built in 1895, is 4,397 ft long. Until the installation of the vertical lift span it consisted of two approach spans, three 533-ft fixed truss spans and a 323-ft swing span. The latter provided two clear openings of 120-ft each.

To adapt the Delair bridge to the proposed conditions PRR engineers decided that the best course of action would be to convert the existing swing span to a fixed span and replace the adjacent fixed truss span with a vertical lift span. In putting this plan into effect it was evident that about 625 ft would be needed to make room for the new lift span and its towers, or about 100 ft more than the length of the fixed span being replaced.

The manner in which the adjacent fixed span was shortened to make way for the vertical lift span and the nature of the substructure work required are indicated by the heavy lines on the photograph.

Preliminary work in carrying out the Delair Bridge project included construction of the necessary additional piers for the towers of the vertical lift span and the cutting back of the adjacent fixed span.

The latter operation was accomplished under traffic by supporting the tracks and trusses on falsework and jacking each truss to a no-load position. A new end panel was then constructed for the shortened span and supported on the new substructure that had been constructed for the adjacent tower span.

In constructing the new substructure sheet-steel piling cofferdams were first driven at the locations of the new piers. The cofferdams were then dredged to the bottom elevation of the seal concrete and bearing piles driven. Concrete for the seals was pumped to the site from the shore and placed in the cofferdams by the use of tremie chutes. Bracing for the cofferdams was installed as they were dewatered to expose the seal concrete. Base and shaft concrete was poured in formwork constructed in the usual manner, with all concrete being pumped from the shore to the piers.

Meanwhile, the American Bridge Division of United States Steel Corp., which had the contract for the superstructure, was making preparations for installing the new vertical lift span. Provision was made to permit the contractor to occupy one or both tracks for various periods of time when necessary.

The plan that was developed for installing the new span called for erecting it at an off-site location on falsework supported on barges and floating it into position. Similarly the plan was to float out the 533-ft fixed span. The latter step was accomplished, as shown in the photograph at the left, by two barges on which falsework had been erected. The barges were floated in at low tide on March 16. After being lifted from its piers the old span was floated out at high tide that day.

The new lift span was completely assembled, including track structure, signals and overhead catenary system, on four barges. First step in its construction was the erection of 375 tons of steel falsework aboard the barges. The span was then built on top of the falsework in a cantilevering fashion. Weight of the new span is nearly 2700 tons.

On March 19, three days after the fixed span was floated out of position, the new span, with the barges guided and controlled by tugs, was floated into position, as shown by the photo at the left. This operation was carried out at high tide so that the span could be landed on the piers as the tide receded.

During the three days the spans were being changed out river traffic in the area was restricted, freight trains were detoured and passengers were shuttled across the river from and to Philadelphia by chartered bus.

Plans call for the placement of an erection tower on each end of the lift span. With a stiffleg derrick mounted on top, the tower will be used to erect the tower spans, machinery houses, control house and counterweights. As one of the final steps the transmission wires, which had been carried on temporary towers during the construction period, will be shifted to their permanent position and the temporary towers dismantled.

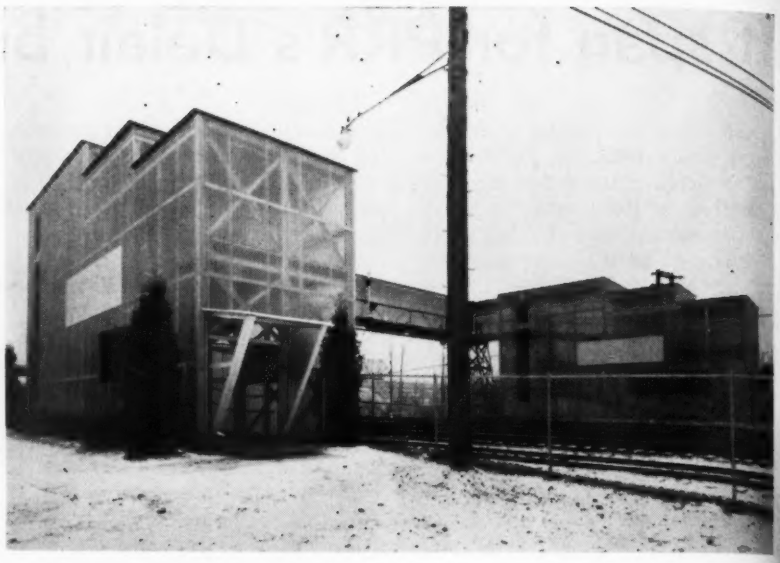
When completed the towers for the vertical-lift span will be 250 ft high. At each tower the span will be supported by forty-eight 2⅜-in wire ropes which will pass over four 15-ft diameter sheaves to connections with the balancing counterweights.

Power for normal operation of the span will be furnished by two 221-hp dc motors, one in each tower. The motors will be geared to the main counterweight sheaves and are designed to raise the span in two minutes. The span will be controlled from a desk console located on the top floor of a three-story control house in one tower.

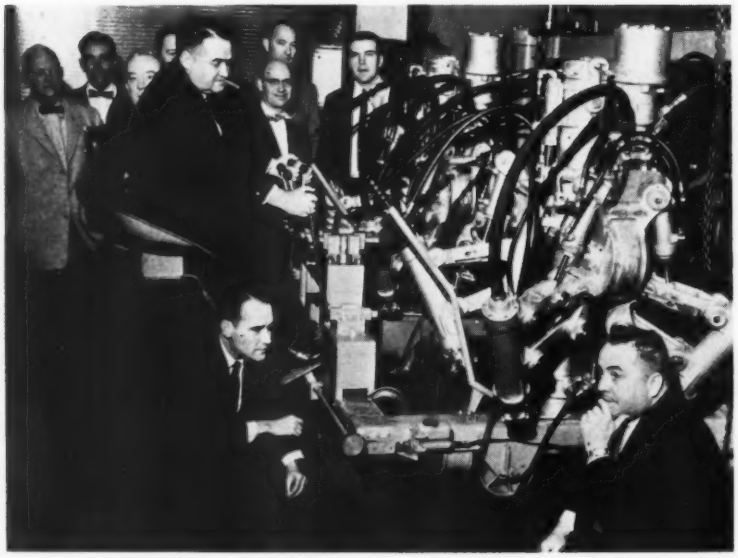
It is said the lift span proper is the longest double-track lift span in the world.

Bridge enclosed for safety

The new pedestrian bridge over tracks of the NYC at Minoa, N.Y., has been enclosed for the safety of people using it and to protect them from the elements. Manufactured by Structoglas, Inc., the enclosing material consists of corrugated panels of translucent fiberglass and eliminates the need for artificial lighting during daylight. Panels were fastened to the steel framework of the track span and stairway structures.



News briefs in pictures . . .

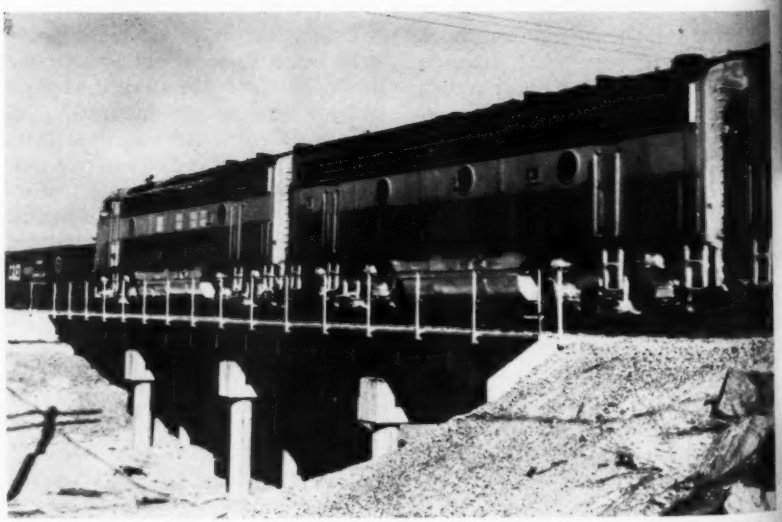


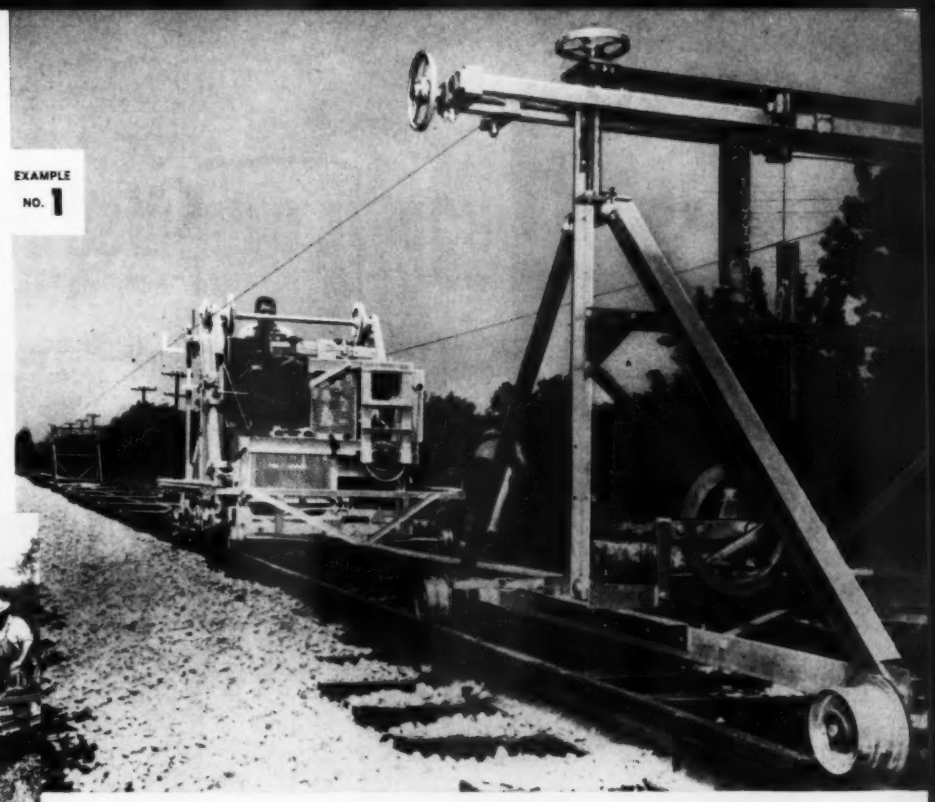
Distributors visit Racine plant

Distributors for Racine Hydraulics & Machinery, Inc., recently visited the company's plant at Racine, Wis. Inspecting the new Oct-A-Gun spot tamper are, standing left to right, R. B. Hill, Chicago; William McIlrath, plant superintendent; G. W. Achuff, St. Louis, Mo.; G. W. Christianson, division manager (behind Achuff); W. E. Swan, sales manager; S. Shutt, San Francisco, Cal.; and J. Mahon, Cleveland, Ohio. G. C. Hunt, Atlanta, Ga., is in operator's seat and J. Haigh, St. Paul, Minn., and L. Hunt, Atlanta, are in foreground. Visit occurred after AREA meeting.

Prestressed concrete trestle

The Western Pacific recently completed construction of a 100-ft ballasted-deck prestressed concrete trestle near its yard at Stockton, Cal. Replacing a seven-panel timber trestle, the new single-track structure has four 25-ft spans which consist of five 2-ft 4-in square stringers, each with a 16-in round hole in the center, metal walkways on each side and metal ballast retainers. The stringers were placed in panels and anchored by doweling the outside stringers to the poured-in-place caps. The trestle has five bents, each bent having three 20-in octagonal prestressed hollow-core piles. The piles were placed in permanent compression of approximately 700 psi to allow them to withstand flexure stresses imposed during handling and driving. The piles were driven by the road's on-track pile driver using a Vulcan "O" hammer.





EXAMPLE NO. 1

SURFACING OPERATIONS

The Nordberg Tamping Power Jack and Trak-Surfacer team raises track, tamps ties to hold the raise, and provides propulsion power. The Trak-Surfacer uses a stretched wire to form a reference line for the top of the grade rail. Following right after, the Gang Tamper tamps all ties. Then the Trakliner® and Line Indicator line tangent and curve track.

EXAMPLE NO. 2

RELAYING OPERATIONS

The Dun-Rite® Gaging Machine and Bronco is the key machine, used with these other Nordberg units: Power Wrench, Self-Propelled Spike Puller, Ballast Router, Self-Propelled Adzing Machine, Rail Drill, Tie Drill and Spike Hammer, for completely mechanized relaying operations.

EXAMPLE NO. 3

TIE RENEWAL OPERATIONS

The Nordberg Gandy® is one of the important machines used for reducing tie renewal costs. This efficient unit is used to pull out old ties, insert new ties, pile or load old ties, set machines on or off the track, and distribute new ties. Other Nordberg machines for tie renewal include the Hydraulic Spike Puller and Carriage, Tie Drill and Spike Hammer.

ORGANIZED MECHANIZATION
with NORDBERG MECHANICAL MUSCLES will give you maximum maintenance economy

ORGANIZED MECHANIZATION has two vital parts. First, *providing the best combination of equipment to do a given job*, and second, *coordinating that equipment into an efficient working team.*

The advantages of Organized Mechanization, utilizing Nordberg Mechanical Muscles are (1) Single source of responsibility for all machines; (2) Each machine designed and built to work most efficiently with other Nordberg machines; (3) Maximum parts interchangeability between machines; and (4) Training of operators is easier and abilities are readily transferred to operate all machines built and backed by Nordberg.

Illustrated are three examples of the way in which Nordberg Mechanical Muscles are used to make up Organized Mechanization teams for specific maintenance work . . . *to assure better, faster track maintenance operations at the lowest cost.*

For more complete information covering the use of these money-saving Nordberg Mechanical Muscles in ORGANIZED MECHANIZATION, call or write today.

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RSOS-R

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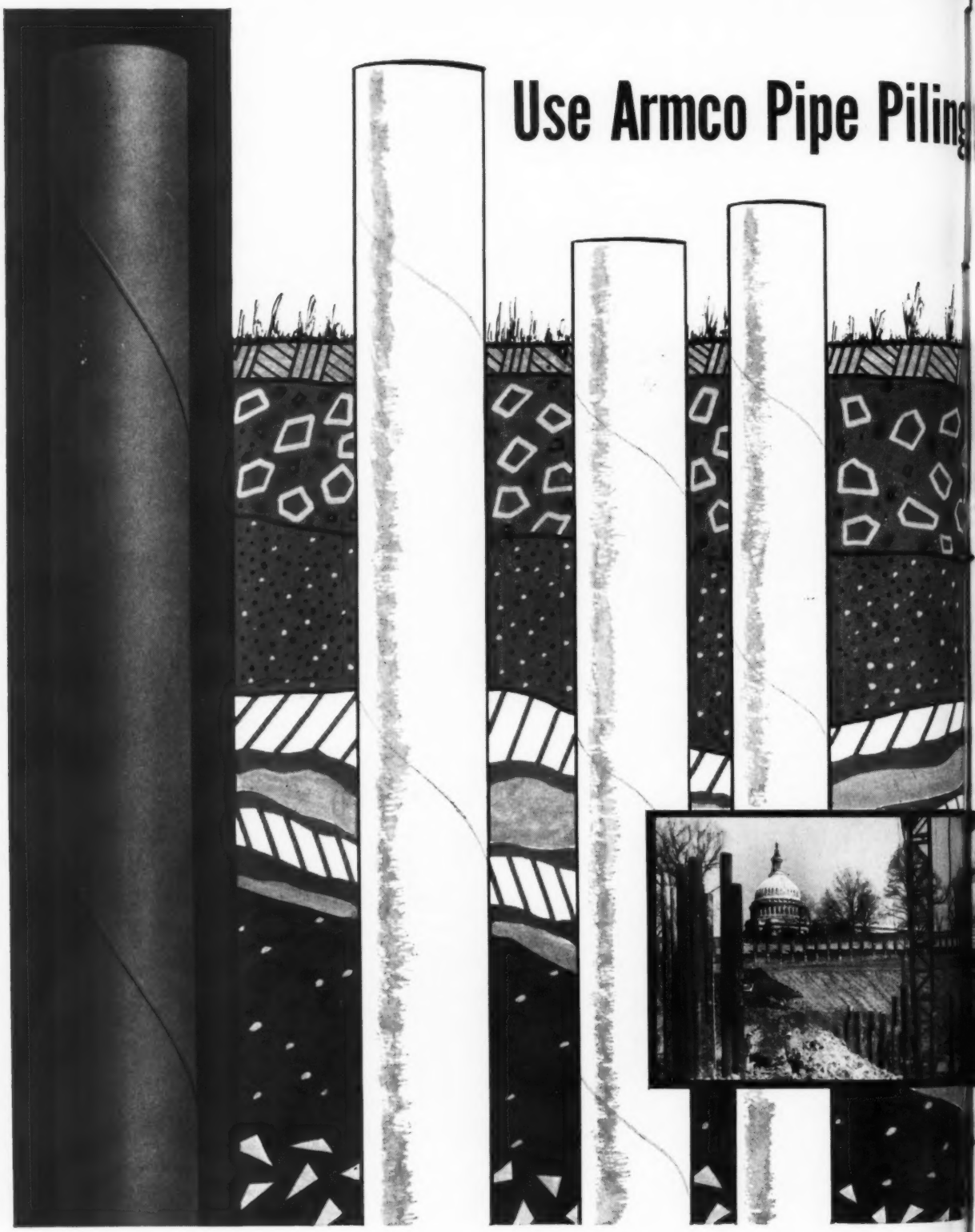
NORDBERG Mechanical Muscles®

Use Armco Pipe Piling



ing..You can check it where it counts most

IN THE GROUND

When you specify and use Armco Steel Pipe Piling, you'll find advantages that no other type of foundation product can deliver. *After it's in the ground,* you can make a quick, sure check for alignment and watertightness. A light or reflector lets you see all the way to the bottom. You *know* where each pile goes—no doubt about it.

You can get Armco Pipe Piling in 132 different diameter-wall thickness combinations. Lengths are practically unlimited. In addition, you can meet foundation pipe needs from lightweight Armco HEL-COR® Pile Shells. These shells are available in diameters from 10⅝" to 22". Thus, it is an easy matter to specify an Armco Foundation Pipe that meets your *exact* requirements. Get details now. Send coupon for 16-page catalog on Armco Foundation Products. Armco Drainage & Metal Products, Inc., 5670 Curtis Street, Middletown, Ohio.

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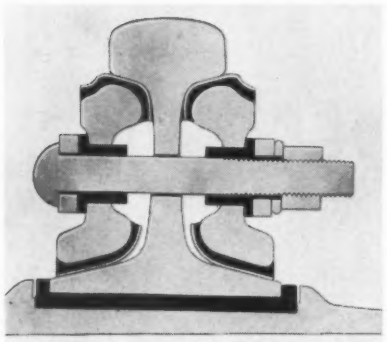
PRODUCTS

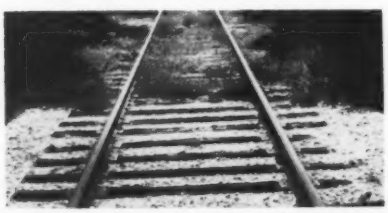


Bonded rubber used for . . .

Insulated joints

LOW installation costs and maintenance and long service life are the features claimed for the new VulcaBond insulated rail joint. The joint consists of standard joint bars, washers and tie plate to which Buna N rubber insulation is bonded. The new joints are said to reduce the number of components in the joint package from 33 to 8. The insulation on the contact areas of the bars is protected from abrasion by steel plates bonded to the rubber. In addition the plates serve to distribute the bearing pressure over a greater area of the insulation.

The rubber insulation is claimed to endure long, hard use and to resist oil, grease and temperature extremes. The joints are stated to provide electrical resistance from 10,000 megohms to infinity between rail ends. *Johnson Rubber Company, Dept. RTS, 111 Vine St., Middlefield, Ohio.*



LIQUID Urox was sprayed on portion of track in foreground six months before picture was taken of test plot.

For hard-to-kill species . . .

Liquid weed killer

A UREA-TYPE weed killer has been made available in liquid form. It is an oil-soluble form of the granular Urox used by railroads. The liquid can be mixed with locally available oils, such as kerosene or fuel or diesel oil, in the tank car from which it is to be sprayed. The liquid Urox is reported to go into a true solution that can be sprayed with conventional equipment. No agitation is required in the tank cars during the spraying process. It is employed at the same rate of active ingredient, 32.4 per cent, as the granular type, but is claimed to provide quicker kill.

Recommended for large-scale spraying along the right of way, liquid Urox should be applied shortly before, or at the time, plant growth begins, it is stated. Rains or a thorough watering after application is said to cause the liquid chemical to move to the root zone. The manufacturer states that many hard-to-kill weeds are not only killed fast with the liquid Urox but are controlled for periods up to 1½ years or more. Results from application of the material in various parts of the country, in different types of soil and climatic conditions, are stated to show that normally only one application a year is required. Liquid Urox is claimed to be effective on a wide range of annual and perennial grasses, as well as on broad-leaved weeds. It is also said that light booster doses, 50 per cent below initial application rates, will keep most areas free of weeds from one season to another.

It is stated that granular Urox is still well suited for application in yards, on spurs and sidings and around buildings. *Allied Chemical Corporation, General Chemical Division, Dept. RTS, New York 6.*

●

For shops and yards . . .

Air dryers

CLAIMED to prolong the life and reduce the maintenance of all types of pneumatic equipment, the Van line of compressed air dryers is available for both stationary and mobile air systems. The dryers are constructed in 33 sizes with a range of capacities from total air for an entire shop or yard down to minimal air for the smallest instrument or tool.

The dryers are designed to be located downstream from the receiver-reservoir in order to intercept water, water vapor, acid fumes and microscopic solids produced by air compression. A triple dessicator, using Dry-O-Lite solution and pellets as the drying agents, is utilized by the units to remove these corrosive and abrasive elements. Operation of the dryer is stated to be continuous and automatic without heat, power, regeneration, injection, volume loss, carryover or appreciable pressure drop.

Features claimed for the units include extraction of all water from compressed air, reduction of vaporous moisture below zero, F deg, dewpoint; reduction of gaseous oils and foreign particles down to sub-micronic size; destruction of bacteria; and elimination of air-line freezeups. *Van Products Company, Dept. RTS, Erie, Pa.*

Automatic control for . . .

Spike puller

A NEW hydraulic spike puller is available that has an automatic control for removing hard-to-pull spikes. Designated the Fairmont W84 Series C, it is equipped with a split-flow pump for pulling spikes out of ties. The manufacturer states that the control automatically furnishes high pressures for pulling spikes tightly embedded in the tie. *Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.*

(More "Products" on page 44)

even in

"BLOW-SAND" TERRITORY

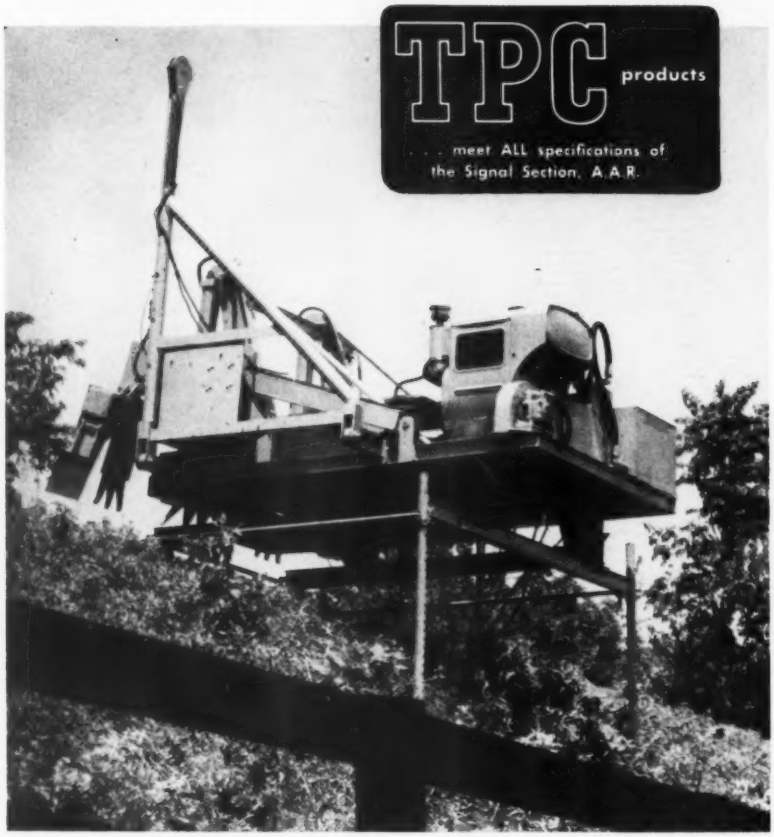
BIRD SELF-SEALING TIE PADS EXTEND TIE LIFE OVER 50%

Not one grain of sand or other foreign material can penetrate the seal provided by Bird Self-Sealing Tie Pads . . . on grades, at station platforms, or even in destructive "blow-sand" territory.

Bird Self-Sealing Tie Pads protect the wood under tie plates and around spike holes from deterioration caused by moisture and abrasive materials such as sand, dirt, grit, dust, platform sweepings, etc. And Bird Self-Sealing Tie Pads are the *only* tie pads whose durable and effective seal with the tie has been *proved* through years of in-track service on main-line tangents, curves, bridges, and other critical areas.

By extending tie life as much as 50%, Bird Self-Sealing Tie Pads quickly pay for themselves — and give you substantial savings through reduction of track maintenance costs. For an interesting booklet giving facts and figures on dollar savings, write Bird Tie Pads, East Walpole, Massachusetts, Dept. HPS.

In-track experience proves . . .
BIRD TIE PADS
save up to $1000.00 per mile per year



UNIVERSAL SET-OFFS THAT DO THE JOB!

Shown in the above photo is the Model M 100-15 Universal Set-Off with the Kershaw cribber and tie remover. Notice the extreme slope of the berm, and how this TPC Universal Set-Off adapts to these unusual conditions. It takes only 2 men approximately 10 minutes to completely set up this TPC Universal Set-Off ready for use.

Here is a real time and labor saver, that is strong, durable and easily transported from site to site.

TPC M 400-5 SET-OFF

This set-off is designed to accommodate weights up to 40,000 lbs., and is shown here with the Fairmont Ballast Regulator. Write today for additional set-off information.

TRANSPORT PRODUCTS CORPORATION

3008 MAGAZINE ST. • LOUISVILLE, KY.

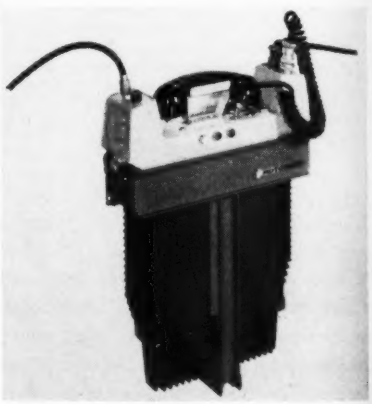
Products (cont'd)

For Hayco Lining Scope . . .

New carrying case

CONSTRUCTED of bright orange-red fiber-glass, the new carrying case for the Hayco Model HL Lining Scope is easily visible along the track. Weighing 11 lb, the 8-in by 8-in by 30-in case is stated to be stronger, more compact and weatherproof. It has nickelplated hardware and a leather handle. The interior of the case is braced with spruce and flocked in dark green.

The case may be ordered for use with Model HL scopes now in service. *The Brice Hayes Company, Dept. RTS, 6710 Northwest Highway, Chicago 31.*

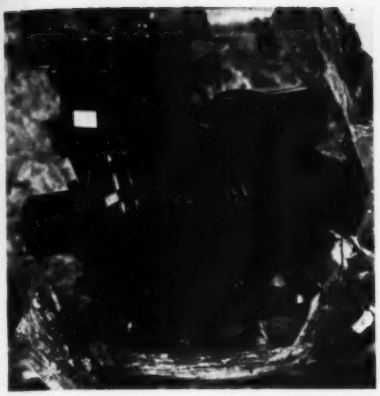


Designed for railroad use . . .

Two-way radio

A COMPLETELY self-contained version of the new extensively transitorized Motrac two-way radio has been developed for railroad use by Motorola. Consisting of a transmitter-receiver, handset, controls and two speakers, each providing five watts of audio output, the unit operates from a 12-v dc source and is available in the 152-174-mc frequency band. The radio is stated to feature a completely transistorized receiver and power supply and partially transistorized transmitter. It provides 25 watts RF output.

Designed for use in maintenance-of-way vehicles, the radio can be installed in the new Motorola T-frame mounting bracket. The frame permits the entire radio to be inserted from the top and latches on both sides to hold the radio firmly in place. The latches can be padlocked for security. *Motorola, Inc., Communications and Industrial Electronics Division, Dept. RTS, 4501 W. Augusta Blvd., Chicago 51.*



Introduces new series of . . .

Electric plants

A NEW series of air-cooled, diesel-powered electric plants is available in capacities of 2,000, 5,000 and 7,500 watts. The manufacturer claims that the units are engineered for heavy-duty use in the railroad, construction, marine and industrial fields and can be used as a power source for camp cars, general lighting requirements, construction projects, communication facilities and stand-by power for lodges and recreation facilities. Features claimed for the new electric plants are fuel economy, safety, and continuous full-load performance with a minimum of maintenance. The units are equipped with a solenoid-operated compression release for the purpose of ensuring easy, reliable starting. *Kohler Company, Dept. RTS, Kohler, Wis.*

Lift 60,000 lb with . . .

Sprawler crane

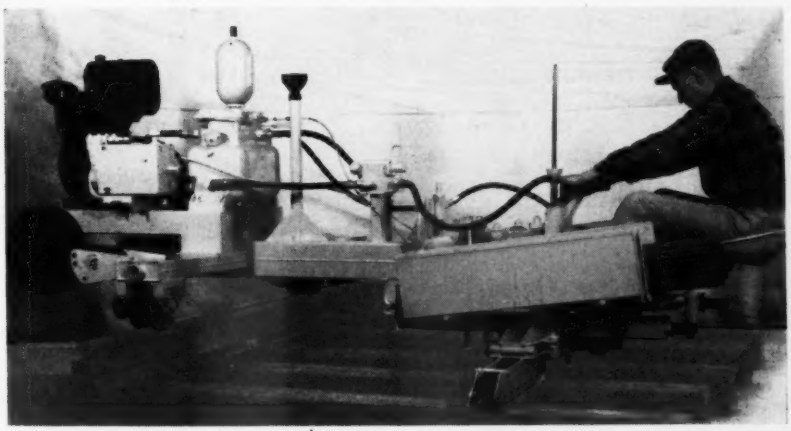
A NEW crawler-mounted crane is available which is claimed to be able to lift more than its own weight. Designated the Model 330 Sprawler crane, it is stated to be able to lift 60,000 lb with a 30-ft boom working at a radius of 12 ft and with outriggers set. With the outriggers folded against the crawlers, it is claimed that the machine will lift and carry 47,980 lb with a 30-ft boom at a radius of 10 ft. The outriggers are the same pivoting type used on the Model 545 Sprawler. The manufacturer states that the Model 330 is designed to combine high lifting capacity with ease of transportation. *Koehring Division, Dept. RTS, Milwaukee 16, Wis.*

For spike killed ties . . .

Plastic plug

SPIKE-HOLDING power of spike-killed ties is claimed to be restored when new plastic insert plugs are installed in the old spike holes. The manufacturer states that the plug, known as the Tie Life Saver, consists of a very tough and slightly resilient plastic that has the ability to resist pressures and working stresses of the track as well as the destructive elements of nature. The plug is 4 in long and 1⅛ in. in diameter with a hole, slightly less than ⅝ in square, throughout its length.

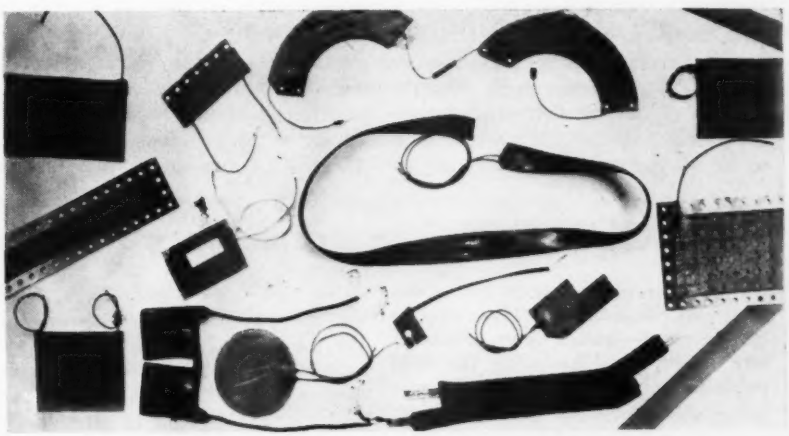
The plug is inserted into one of the old spike holes which has been reamed to its size. The spike is then driven into the hole, giving, it is claimed, the original holding power of the tie. The new plastic Tie Life Saver plugs are claimed by the manufacturer to be effective in prolonging the life of the ties. *Railroad Rubber Products, Inc., Dept. RTS, 4538 Main Ave., Ashtabula, Ohio.*



One-man operation for . . .

Tie-plug inserter

CONTROLLED by one man, the Fairmont W104 Series A machine sets and drives tie plugs. The plugs, in stick form, are fed by hand from bins on each side of the machine into a guide slot located above the driver. They are then cut and driven into the tie. Propulsion, cutting and driving are done hydraulically. *Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.*



Versatility claimed for . . .

Heating units

TEMPERATURES up to 450 deg F can be directly applied to areas where required, it is claimed, by the use of flexible, silicone rubber heaters. Consisting of resistance wire grids moulded within the insulating material, the heaters are stated to have a high dialectric strength and high power density. Features claimed for them include the ability to perform continuously at maximum temperatures, a tough and lightweight heating element, easy installation and even dissipation of heat energy.

The manufacturer states that the heaters can be fabricated in any plane shape and the material can be cemented to all types of surfaces or fastened by means of grommets. The elements are designed so that the leads can be taken out at any point along the edge of the heater. The shape and length of the heater, and its wattage and voltage, it is claimed, can be varied to suit application requirements. *The Rails Company, Dept. RTS, 187 Maplewood Ave., Maplewood, N. J.*

Set-offs for track machines

What factors determine the necessity of providing a portable set-off for a track machine? Is the weight of a machine the primary factor? Explain.

Increases production

By E. P. STRAUGHAN
General Roadmaster
Spokane, Portland & Seattle
Portland, Ore.

The necessity of keeping track machines operating and producing to their fullest capacity is of most importance if railroads are to realize the benefits of increased production and labor-saving economy. To do this with the least delay and interruption of the work when clearing for trains or starting and closing a work period, machines must be placed and removed from the tracks quickly.

This can be accomplished by the use of portable set-offs adapted for machines which require more than two or three men to remove them from track. These include production tampers, spot tampers, track liners, jack tampers, ballast equalizers and brooms, and machines of comparable weight. The set-offs must be constructed of durable lightweight material and of a design that permits them to be set up or dismantled, moved daily or as often as necessary as the work progresses.

Portable set-offs provide the means for more on-track time, which is necessary for most production and economy.

Permits inspection

By H. F. MARTENS
Assistant Roadmaster
Atchison, Topeka & Santa Fe
Amarillo, Tex.

An important problem today, in connection with roadway equipment, is that of preventive maintenance. The portable set-off is an aid in this direction because it permits underframe inspection. With the portable set-off the operators of the machines have an unobstructed view and room to move beneath them when inspecting their units while set off the track. Formerly, the old-style cribbed-crosstie set-offs restricted both the view and movement of the operator when he wanted to check conditions under his machine.

Another advantage of today's set-offs is the ease in handling them and the time saved in their erection as compared with the cribbed-tie set-off. The modern portable set-off can be moved from one location to another with little or no difficulty. They eliminate the need to gather enough crossties for building set-offs, then moving them or leaving them behind to be recovered at a later date.

Portable set-offs are so designed that they can be easily set up and moved by two men. Their simplicity of design enables everyone to quickly understand how to assemble them. But good judgement should be used as to when and where they should be located.

I think that, as new machines come into use, the set-off manufacturers will design assemblies to fit the new machines. They will also keep their weights low and design them for all types of terrain.

Cost is factor

By T. L. BIGGAR
General Supervisor Track
Chesapeake & Ohio
Richmond, Va.

On sections of track where trains are detoured the need for portable set-offs is not as great as on single track

(Continued on page 52)

NEW QUESTIONS to be answered in August

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you wish your name withheld, we'll gladly comply.

DEADLINE: June 30

• 1. To what extent should operators be permitted to make "minor adjustments and repairs" to their machines? Where does the operator's responsibility in this regard cease and the mechanic's begin? Explain fully. How is this separation of responsibility controlled?

• 2. What prior "signs," if any, indicate that a sun-kink in rail is imminent? What conditions contribute to the occurrence of sun-kinks and how can they be avoided? What are the proper steps that should be taken to restore correct line and surface after a sun-kink occurs? Explain in detail.

• 3. What factors determine when it is no longer economical to patch or repair roofing and when a new roof is justified? Explain.

• 4. The general practice is to work two laborers just ahead of a production tamper for forking ballast to the inside of the rails. Would it be possible to eliminate these two men by placing more ballast inside the rails when unloading fresh ballast, or by using a ballast equalizing machine to do this ahead of the raising? Explain.

• 5. Under what conditions is it necessary to provide headwalls at the ends of culverts? What are their advantages and disadvantages? Explain.

Send answers to:

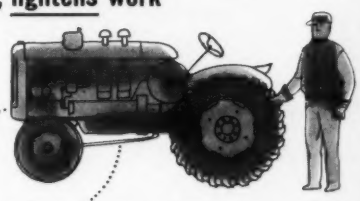
What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.

WHERE RAILROADS LOOK HARD AT MAINTENANCE-OF-WAY COSTS, THE CHOICE IS PNEUMATRACTORS!

1 Schramm double-duty unit speeds jobs, saves money, lightens work

it combines 125 cfm compressor

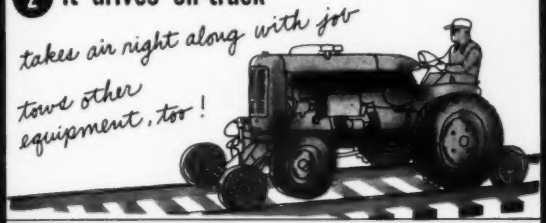


on husky tractor ... gives maximum mobility

2 it drives on-track

takes air right along with job

tows other equipment, too!



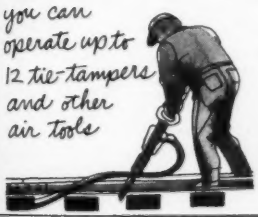
3 it drives off-track

or wherever needed

use it here ... then along right-of-way

4 it gives maximum efficiency

you can operate up to 12 tie-tampers and other air tools



and use tractor to push, pull, haul

5 yet a Schramm Pneumatractor costs little more than a portable compressor alone!

cost competitive portable 125 ..... $4,750

cost Schramm Pneumatractor $4,840

Less than $100 for self-propulsion!

no wonder railroads are using fleets of Pneumatractors

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Schramm PNEUMATRACTORS

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IGLOO

solves your on-the-job thirst problems

By strategically placing IGLOO Water Coolers about the job (one for every 6 or 8 men) you will have less "watering time" and more work. IGLOO's built-in cleanliness pays off in employee relations, too.

When you order water coolers, specify IGLOO because:

- It's been proven in use—thousands of times
- It's PERMALINED and has easy-to-clean, round inside bottom
- It's corrugated for greater strength
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***IGLOO** the world's No. 1 Water Cooler is available in 23 sizes and models— with one exactly for your job.*

IGLOO No.1

IGLOO

Memphis 18, Tennessee

NEW ...HEAVY-DUTY BANTAM RAIL-ROADER offers Big 11-Ton Capacity!

BIG-JOB 11-TON CARRIER RAIL-ROADER MODEL JOINS JOB-PROVED 8-TON MODEL TO INCREASE WORK RANGE ON TRACK AND OFF!

Here's a big boost to B&B and track department production! Now you can have your BANTAM Rail-Roader mounted on either the job-proved 8-ton BANTAM carrier or on the new, heavy-duty 11-ton Rail-Roader carrier! New 11-ton Rail-Roader capacity lets you lift more . . . *do* more to round out the work range and extend the schedules of your B&B and track departments on track and off.

Work this bigger BANTAM *on* track for all kinds of heavy-duty right-of-way construction and maintenance jobs. Work it *off* track for maximum capacity on building or yard assignments. The same exclusive and simplified retractable-dolly-wheel design that made the 8-ton Rail-Roader so popular is used on the new 11-ton model to provide easy drive-on or off at any crossing. Special high-speed, full-reversing transmission gives the 11-ton Rail-Roader the same track speeds forward and reverse as in the 8-ton model. On highway, both models travel permit-free at road speeds anywhere.

Only BANTAM job-matches both carrier and upper machinery because only BANTAM builds both. Redecking, bridge restringing, cap changing, rail setting, materials handling—no matter what the job, BANTAM handles the work better and faster than any other rig in its class. Choose 8- or 11-ton capacity . . . your job schedules will speed up with a BANTAM Rail-Roader.

See how a BANTAM Rail-Roader can speed up your jobs and cut equipment costs. Ask your BANTAM railroad distributor for the facts . . . or write us.

11-ton Rail-Roader carrier is BANTAM-built for lasting service. Massive 15" x 6" box-beam frame assures rigid stability on heaviest lifts . . . rugged 6 x 6 drive offers maximum traction on track or off. The same unique dolly-wheel principle as featured on the 8-ton Rail-Roader eliminates derailing danger when crossing switches, road crossings, etc. Truck tires ride on the rails, not on the ties or suspended in the air—eliminating binding and tearing, and giving greater stability, traction and safety at all times.

See How YOUR RAILROAD Can Pro

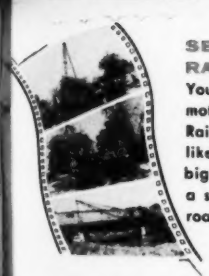
Eleven BANTAM-built attachments make every Rail-Roader's work range unlimited!

Whether your BANTAM is the new 11-ton model or the popular 8-ton model, with this one basic tool you can excavate, load, unload, ditch, erect, drive pilings, handle materials, etc. And with BANTAM's optional remote-control operation, you control all movements of the carrier from the operator's cab, saving time and manpower.

Self-propelled BANTAM Rail-Roader is ideal for busy yards. One-engine, one-man operation with full 11-ton lifting capacity. Unlimited work range in yards, on sidings; travels and works on track or off. Speeds to 12 m.p.h. in either direction. Ideal for stores depts.

Exclusive BANTAM Rail Threader (pat. pend.), mounted on rear outrigger of 8- or 11-ton Rail-Roader, works with second threader carried by hoist line to place ribbon rail on roadbed. Rail-Roader then positions new rail to gauge rapidly and smoothly in just one operation!

Popular BANTAM 8-ton-capacity Rail-Roader. Here's the compact rig that's proved itself on miles and miles of tracks and hundreds of job assignments for modern railroads. It's letter-perfect for your needs—travels anywhere, on track or off; gives faster work cycles no matter what the job.



SEE THE BANTAM RAIL-ROADER IN ACTION! You'll want to see one of the color motion pictures of the BANTAM Rail-Roader actually working on jobs like yours—pointing up typically big savings you can make. Arrange a showing with your BANTAM railroad distributor.

New Literature—Write for Catalog RR-200, the new, fully illustrated bulletin that gives you complete information, specifications and application photos.

SCHIELD Bantam Co.

284 Park Street, Waverly, Iowa

WORLD'S LARGEST PRODUCER OF TRUCK CRANE-EXCAVATORS

win the BANTAM RAIL-ROADER

RT-295

The Racor Mechanical Car Retarder applies braking force to both sides of every car wheel that

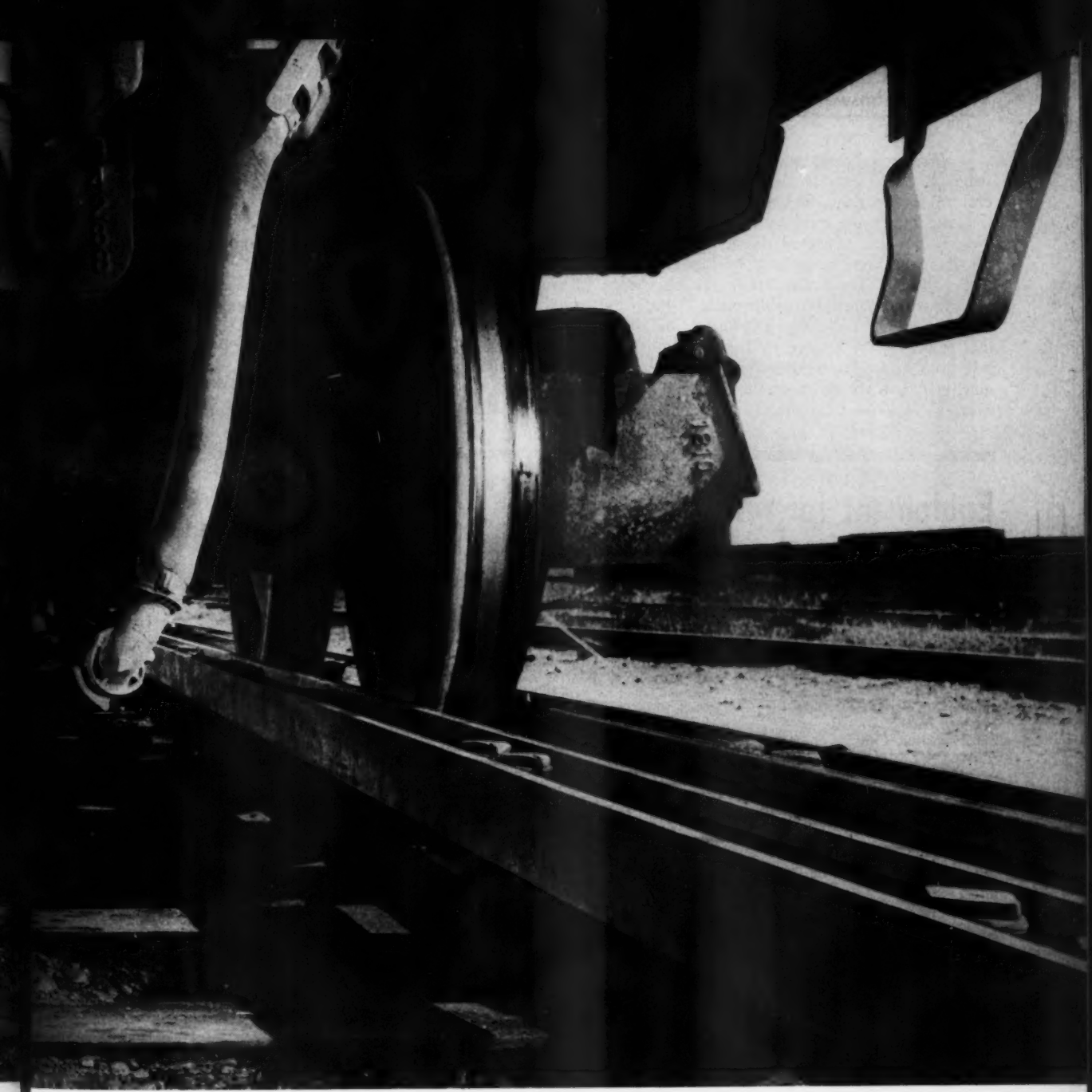
No skates needed here!

NEW RACOR® MECHANICAL CAR RETARDER* IS COMPLETELY AUTOMATIC!

**(Patent Applied For)*

No skates or skate men are needed in gravity classification yards with this new Racor Mechanical Car Retarder at the end of each track! The consequent reduction in operating expense will amortize the cost of the retarders in a short time. Still further savings accrue from reduced damage to lading through absorption of impact as cars come together.

The Racor Mechanical Car Retarder has been designed to bring rolling cars to a stop at the end of gravity classification yard track and to resist their further movement by the impact of succeeding cars. The



enters it. Once adjusted, it needs no further attention—operation is completely automatic.

retarder consists of spring loaded rails which apply retarding force simultaneously to both rim and flange of each pair of wheels. It applies opposing forces in such a way as to eliminate the possibility of derailment. Retarding action is entirely mechanical, and no difficulty is encountered in moving either the cars or the locomotive through the retarder when the track is being "pulled".

Your American Brake Shoe representative will be glad to make a study of the operation of *your* yard in order to determine the savings that can be derived from the installation of Racor Mechanical Car Retarders. American Brake Shoe Company, Railroad Products Division, 530 Fifth Avenue, New York 36, N. Y.

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AMERICAN
Brake Shoe
COMPANY

In Canada: Dominion Brake Shoe Company, Ltd.

Quality products cut your ton-mile costs

(Continued from page 46)

where it is necessary to clear for several trains during the work day.

Quite often side tracks are in the vicinity of work. However, due to the possibility of these being used by the transportation department, they are not always available to maintenance-of-way forces. Frequently, it is found that trains can be cleared by using a side track during the work period, but machinery can not be left on the track overnight because of night switching.

The distance from the place of work to the nearest side track often is the determining factor as to where and how the machinery will be cleared for trains. Also, the grades over which machinery must travel will often influence decisions as to where and how the machinery will be set off the track.

The weight of the machine must be considered when determining where to build the set-off. Where the roadbed is low, especially on fills, great care must be taken in constructing set-offs. Heavy machines should never be set off at a location where the footing for the set-off is questionable.

The governing factor in determining how machinery is to be removed from the main track is cost. In the past few years I think we have all learned to look for the most economical way to do our work. Most equipment today is so designed that it can be removed from track on set-offs in a matter of minutes.

The final decision as to where and how the machines should be removed should usually be left to the foreman and supervisor. They will know local conditions better than any one else and will generally solve the problem in an economical manner.

Equipment for removing drift

What type of equipment can be used to advantage to remove drift that has accumulated against a bridge? Explain advantages.

Crane with clamshell

By A. W. CARLSON
Engineer of Bridges & Structures
Western Pacific
San Francisco, Calif.

There are two conditions to be considered. The removal of drift during flood stages against an existing structure, and the removal of the drift or accumulated material lodged against the structure after the recession of flood waters.

With reference to the first condition: The stationing of adequate personnel with long peaveys or other similar equipment to disengage and guide the material through the structure has in many cases prevented the accumulation of drift at the bridge. However, if the drift is of large dimensions and great quantity and cannot be handled in this manner, this railroad has been very successful in utilizing a rubber-tired crane equipped with clamshell bucket.

With this type of equipment large drift can be disengaged and guided through the opening or lifted over the structure to the downstream side. Finally, in some cases dozers with winches on the bank have successfully pulled debris to the bankside, thus clearing the opening.

With reference to the second condition: If the streambed is dry, the material can be cut in suitable lengths with portable chain saws and pushed through to the downstream side with dozer equipment. If water is present in the streambed, a truck crane with a clamshell bucket could be used either to guide the material through the opening or lift it to the downstream side.

Of course, in the final analysis, the best solution for avoiding the accumulation of drift at any structure is to provide openings of sufficient width to handle large objects. In many cases even the removal of a strategic bent or an upstream obstruction will eliminate this particular, extremely costly problem.

When should piles be posted?

When piling is found to be decaying at the ground line, what is the minimum allowable diameter of remaining sound wood before posting is recommended? How many piles in a bent can be posted before framing is necessary? What proportion of the bents in a bridge can be framed before redriving is recommended?

Would make it 5 in

By W. R. BJORKLUND
District Engineer
Northern Pacific
St. Paul, Minn.

We hear very often on bridge inspections: "It's better than a post." This statement obviously indicates that a piling, even though considerably rotted on the exterior, still has some sound wood at the center. Even five inches of remaining sound wood in a pile will transmit the load better than a post or peg.

The number of piles which can be posted in a bent before framing is necessary depends on a number of factors. The type of runoff is one. Also, if the current is swift and may contain damaging debris, then retaining a few sound piling will greatly stiffen the bent against lateral displacement. The condition of the cap should be considered. If it has deteriorated, then we would be more likely to frame the bent. In general, when 50 per cent of the piling in a bent has been posted, then, probably, the entire bent should be framed.

There is no hard and fast rule as to the number of bents which can be framed before redriving is required. Undoubtedly, some of the bents are in water and will last a great deal longer than those on the dry ground at the ends. In those instances, only a partial

2 WAYS to simplify track maintenance:

Koehring 205 powers its own rail car . . . loads, unloads itself in 10 min. . . . works on or off-track

Wherever there's excavating, lifting or material-handling to be done, Koehring® RailAid® takes to the rails — travels on-track from one work-section to the next at speeds up to 20 m.p.h. It's self-propelled — does 2 to 3 times the work of other excavators or cranes that have to crawl or be hauled from job to job.

At the same time, you get full flexibility for working on or off-track because RailAid combines all the advantages of a self-propelled track crane with the versatility of a standard crawler crane or excavator. It loads or unloads itself on ramp-equipped car in less than 10 minutes. Crane or excavator sets car on and off-track — clears the right-of-way for normal through traffic. Work is uninterrupted for the complete shift. Propulsion car has 2-axle drive, with airbrakes on all 4 wheels. Torque converter gives smooth control of 20 m.p.h. travel speed. Wide car-well accommodates 16, 20 or 24-inch crawlers on excavator or crane. As a crane, Koehring RailAid safely lifts up to 6.9 tons from the car — 8.9 tons on ground. Converts to clamshell, dragline, ½-yard shovel or hoe — cleans ditches, widens banks, stockpiles coal or ballast, loads or unloads cars, repairs trestles, lays rails, does pile-driving. Want more facts? See your Koehring distributor or write today.

Koehring® Mud-Jack® stabilizes track-bed, leaves firm sub-grade, no interruption to rail traffic

Here's a labor-saving way to get better conditioned track, and reduce "slow orders". Koehring Mud-Jack corrects pockets in ballast and sub-grades without interrupting rail traffic. Injection points are driven into the lower ballast. Mud-Jack pumps a soil-cement slurry into weakened area — displaces air, water and water-saturated material — leaves firm *permanent* sub-grade. High fills, as well as shallow grades, are treated by the Mud-Jack method. Slurry can be forced 70 feet deep or more, to stabilize fills at trestle ends. Production capacity: Pumps 200 cubic feet of slurry per hour at pressure of 400 PSI. Read all about it in the new Mud-Jack catalog.

Mail to: KOEHRING Division of Koehring Co., *Milwaukee 16, Wisconsin*

Please send latest catalogs on: ☐ *Mud-Jack* ☐ *RailAid*

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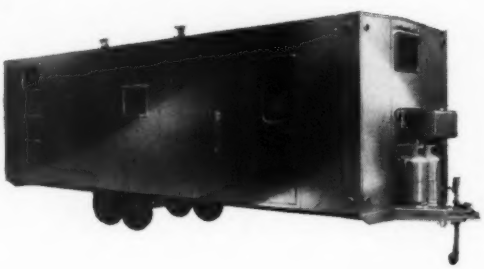
K837 RTS

RailAid **Mud-Jack**

Campcars put the work crew where the work is



. . . in comfort
. . . with economy

House your maintenance crews adjacent to the job — not miles away with a costly loss of payroll eaten up in transit. Campcars provide comfortable on-the-job living for from 2 to 50 men. What's more, they are ruggedly built for on- or off-highway travel, will give long years of service with no wallet-walloping overhead of their own. If you are out to save maintenance money and get jobs done faster, get the complete story of Campcars. Write International Car Division, 2485 Walden Avenue, Buffalo 25, N. Y.

MORRISON-INTERNATIONAL CORP.

Campcars

A SUBSIDIARY OF RYDER SYSTEM, INC.

redrive of the few end bents would provide a structure which would last for a considerable time.

There are also side issues, such as the amount of other work required on the bridge. Assuming that the stringers are in need of renewing, it might be desirable, if the piles are going bad, to redrive the structure at the same time. Another factor to be considered is the general work program for the bridge crew. In some instances where the crew must work on a remote branch line and probably will not return for a number of years, it might be desirable to redrive the structure while the crew is in the vicinity, rather than requiring periodic moving in of gangs.

While the primary consideration must be safety, there are so many economic factors to be considered that no set rule can be made. We feel that for the average timber pile bridge, when one-third of the piling are posted, or are in immediate prospect of requiring posting, then a redrive of the entire bridge is the most economical method of repair.

Should be 9 in

By A. B. WANG
Bridge & Building Supervisor
Monon
Lafayette, Ind.

Piling found decaying at the ground line should have a minimum diameter of 9 in before posting. Not more than two piles in a six-pile bent should be posted, and these should not be adjacent.

It is not good policy to have any frame bents in a main-line high-speed trestle. On slow-speed branch line all bents can be framed, depending on stream conditions. Even so, piles should be cut off well below the ground surface and the sills should be well anchored with as much bent-to-bent bracing as possible.

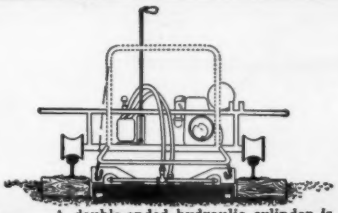
Minimum is 7 in

By F. E. SCHNEIDER
Assistant Engineer
Atchison, Topeka & Santa Fe
Chicago

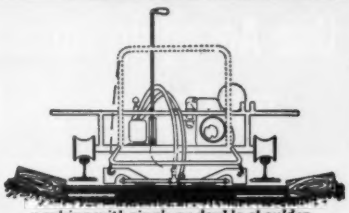
How much rot to permit in timber before repair or replacement is required has been a question for years.

NO MORE TRENCHING!
NO MORE JACKING UP TRACK!

This WOOLERY TIE-REMOVING TEAM NOW ELIMINATES SLOW, COSTLY METHOD



A double-ended hydraulic cylinder is then lowered into the tie bed. A simple turn of the valve moves these two pistons outward, *pushing the tie-ends completely clear of the rail—whether working with single or double shoulder tie plates!* The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.



After the tie has been cut on both sides by the WOOLERY Tie-Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.

Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*

For highest efficiency two Tie Cutters should be used ahead of one Tie End Remover.

The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done *in less than a minute by one man with no more effort than that required to turn a valve!*

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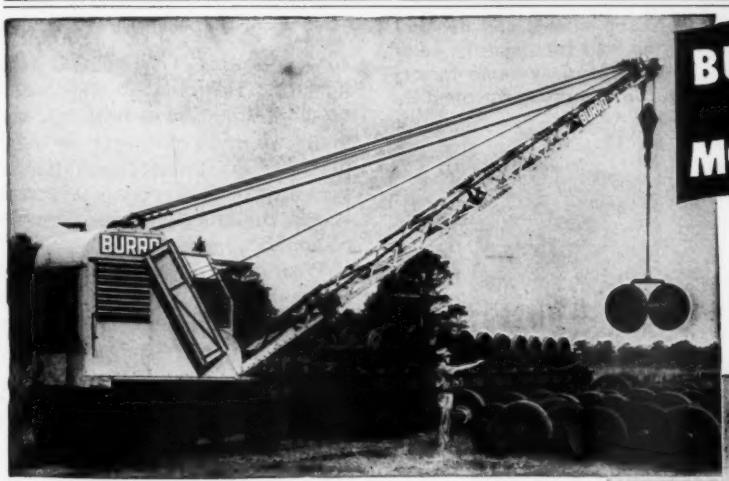
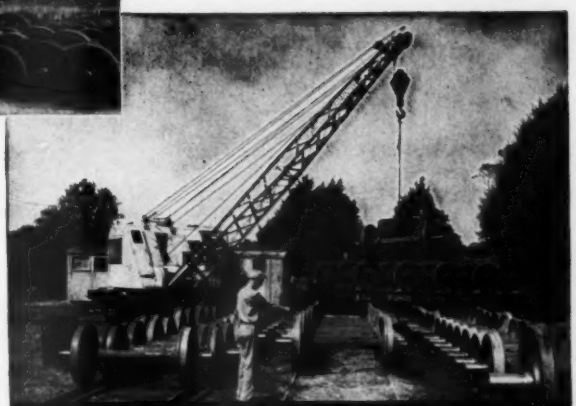
MACHINE COMPANY
2919 Como Ave. S. E., Minneapolis 14



BURRO WORK POWER means... MORE EARNING POWER

Unloading car wheels with a Burro. The Burro moved the flat car into position and will haul it away when wheels are unloaded.



This job—handling wheel assemblies in and out of storage—won't support high costs. That's why a Burro is doing the job.

Any job—on the line, in the yards, or Stores Department—can be done profitably with a Burro because Burros are fast, efficient workers with hook, magnet, tongs, bucket or dragline. Fast travel speeds and heavy draw bar pull enable the Burro to go to the job in a hurry—and even haul its own cars with it!

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ON ALL EQUIPMENT

Aeroquip Hose Lines with Reusable Fittings cut replacement costs on all railroad maintenance equipment.

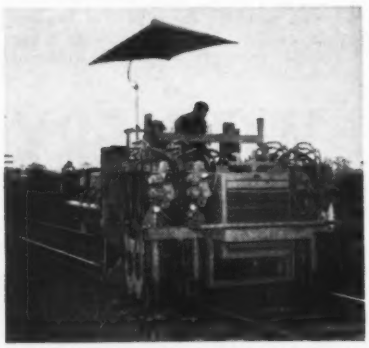
It pays to install Aeroquip replacement hose lines on all railroad maintenance equipment for three big reasons.

First, Aeroquip Hose Lines resist the effects of vibration, flexing and abrasion. This means dependable performance and long life.

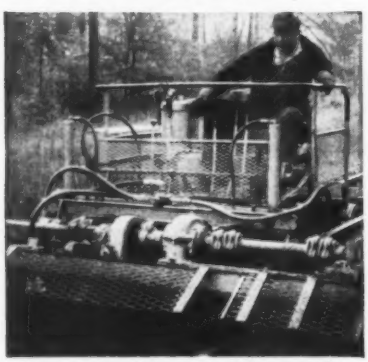
Second, Aeroquip Reusable Fittings can be used over and over. You save 20 to 60% on fluid line replacement costs.

Third, Aeroquip Hose and Reusable Fittings can be assembled and replacement lines installed right in the field. Downtime is cut to a minimum.

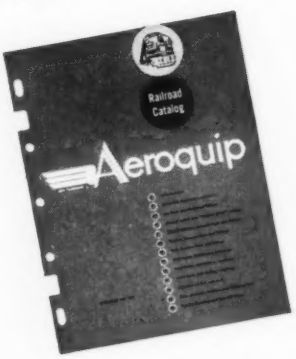
For increased savings and dependability on all fluid lines, specify Aeroquip. See your local Aeroquip factory representative or write us for complete information.



A small inventory of Aeroquip Bulk Hose and Reusable Fittings provide quick replacement fluid lines for this multiple tamper.



Heavy-duty machinery, like this bed-scarifier, features dependable hydraulic lines made from Aeroquip Hose and Reusable Fittings.



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What's the answer? (cont'd)

In the past, maintenance men have been replacing timber at the first evidence of decay. They believed that, once started, decay would progress very rapidly. I think it is now generally accepted that, after the initial attack, decay will usually progress slowly and timber can be carried with some decay present.

Actual stresses measured in piling by electronic strain-gage equipment show that piles are usually subjected to direct load only, and that little, if any, longitudinal or lateral forces ever get into the piling.

Thus the total load and total stress in a pile are lower than theoretical computations would indicate. It is, therefore, my opinion that if you have a center core of 7-in diameter or an outside shell 3 in thick remaining in a decayed pile, it would not be necessary to post the pile because the allowable stresses on the sound timber remaining would not be exceeded. I have seen 10-ft pieces of piling, having the above cores and shells, tested in a hydraulic loading machine under direct load and a factor safety of four seemed to apply before the test specimen failed.

If the above limits of decay are exceeded, posting of the piling is recommended. However, to maintain required stiffness in a bent, not more than two piles per bent should be posted. Also, it is not advisable to post piles in more than every other bent unless special bracing between bents can be applied.

Whether to post the piles and do other work for carrying the structure depends on the economic study of the cost of repair versus replacement.

Two piles per bent

By J. A. JORLETT
Area Engineer - Structures
Pennsylvania
Philadelphia, Pa.

The questioner apparently is interested primarily in the intermediate piles of a trestle rather than the end piles which carry the stringer loads in bearing and the bending loads from the abutments.

A treated pile showing some sign of decay at the ground-line zone can be inspected by tapping with the knob end of an inspection bar or a lightweight

(Continued on page 61)

STRENGTH DURABILITY ECONOMY

THE IMPROVED GAUTIER RAIL ANCHOR

Here is one of the heaviest, and most rugged, rail anchors on the market. It is made from alloy spring steel . . .

it is tough, durable, and sure-gripping with plenty of take-up so that it can be used again and again . . .

it is applied with a maul or spike maul and it can't be overdriven. For Strength, Durability, and Economy . . .

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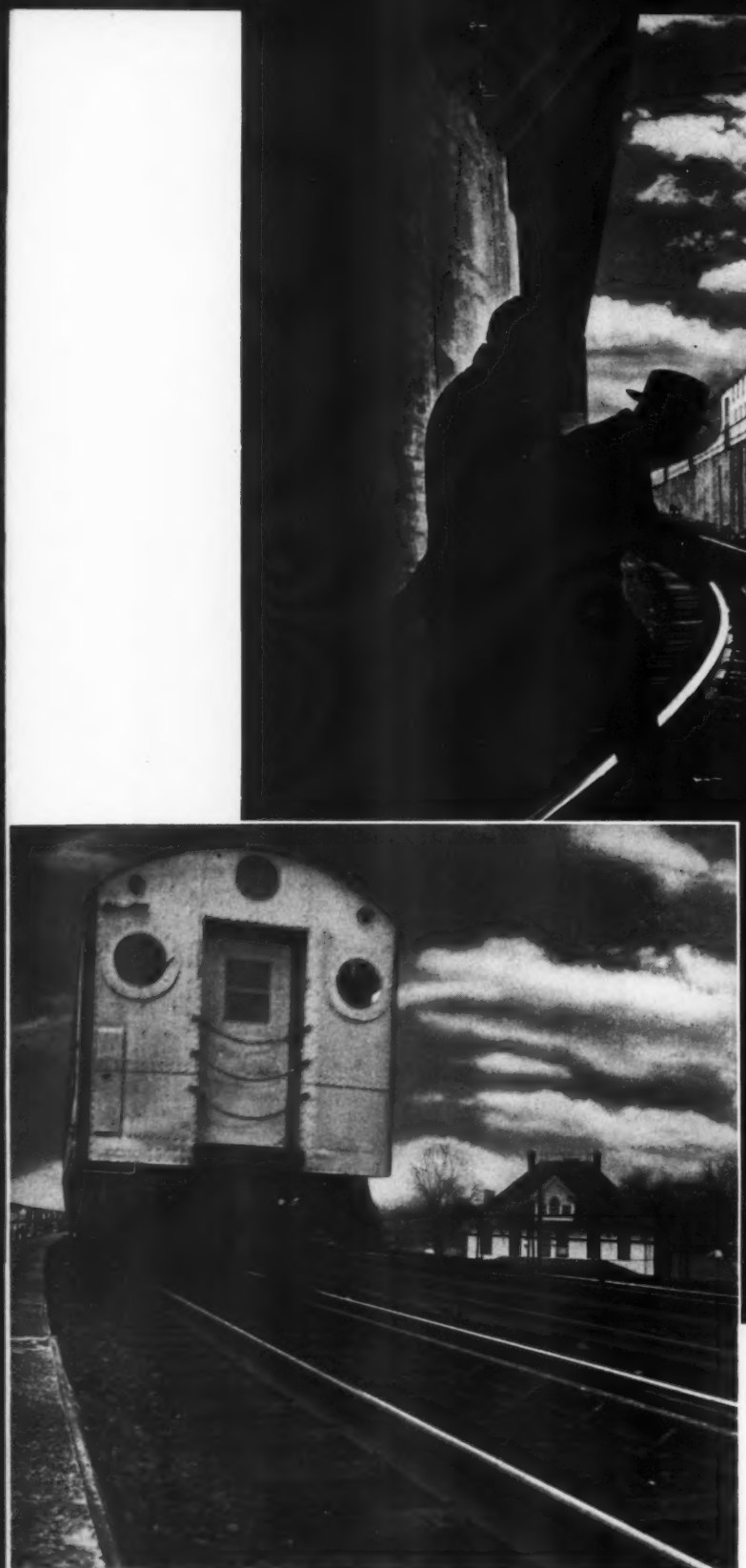


This is an 8 deg curve in an underjump at Jamaica station in which untreated rails gave 1½ years of service. Heat-treated rails are expected to last about 3 times that long before turning.

On Track No. 2, at Lynbrook, untreated rails lasted 2 years in 5 deg curve. They were replaced by these heat-treated rails, which have just been turned after 7 years of service.

BETHLEHEM STEEL

Heat-treated rails give Long Island up to 7 times longer wear

Back in 1952, the "Route of the Dashing Commuter" removed some standard control-cooled rails, worn after two years, and replaced them with 115 RE Bethlehem heat-treated rails. The location was Lynbrook, L.I., Track No. 2. The curvature was 5 degrees, and the purpose was to test curve wear.

In 1959, after seven years' service, the heat-treated rails were turned end for end with the expectation that they will endure another seven years. Since the control-cooled rails lasted but two years, the Long Island stands to gain as much as 7 times longer wear from the heat-treated rails at this point.

Several other test installations of treated rails have been made by the Long Island, some of them illustrated here. The tests are still in progress, but results so far look very favorable.

This is one more in a growing string of success stories for heat-treated rails. There surely must be points on your system where heat-treated rails would give you more for your money. Why not have a talk with one of our engineers?

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

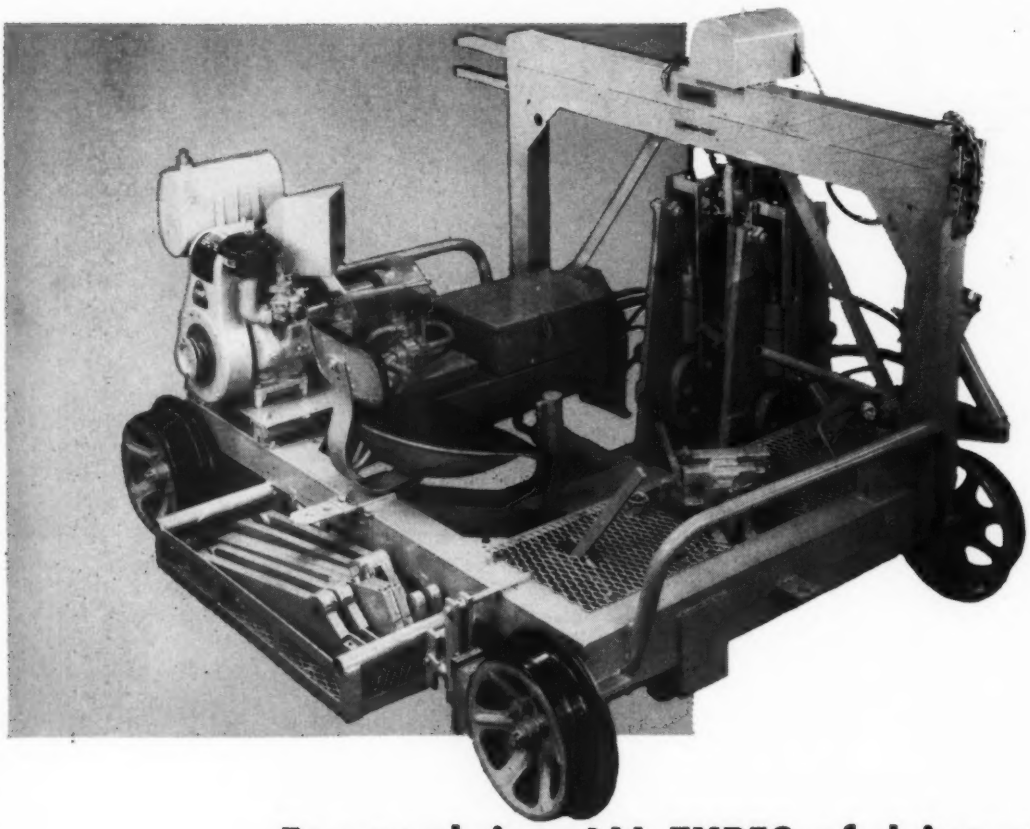
This 8 deg curve at Valley Stream, with heat-treated rails, has already lasted 2½ times as long (before turning) as the untreated rails previously laid here.

Track No. 1 at Lynbrook is also a 5 deg curve; heat-treated rails have already lasted twice as long as control-cooled rails, have not yet been turned.

RACINE

Hydraulically operated

"Anchor Fast" ANCHOR APPLICATOR



For applying ALL TYPES of drive-on or tool applied hang-on anchors

The only machine, of its kind, in the field. The "Anchor-Fast" is hydraulically controlled and self-propelled. Maximum speed 15 mph. Unit is powered by a hydraulic jack cylinder for "off track" movement or can be revolved 180° for work on opposite rail.

CONSTRUCTION AND OPERATION FEATURES

- Smooth hydraulic pressure with adjustable stops, prevents over driving.
- Positive anchor-to-tie application.
- Machine can be used for either single or box anchoring.
- Powered by a 9.2 hp gas engine with clutch and reduction gear.
- Size of unit—95" x 75" x 56". Wgt. 2300 lbs.

RACINE SECO

RACINE HYDRAULICS & MACHINERY, INC.

Machinery Division **Racine, Wisconsin**

What's the answer? (cont'd)

(Continued from page 56)

hammer so as to avoid unnecessary injury or disfiguring to the treated fibers of the wood. A hollow or dead tone will be heard if decay is present. The extent and nature of the decay should be determined. Borings can be taken by means of an increment borer to determine the penetration of the decay as well as the type. If the decay is confined largely to the outer part of the pile, the circle formula can be used to find the area of sound wood remaining. The area of a circle is expressed as Pi r^2 or Pi $d^2/4$ where

Pi is a constant of 3.1416
d is the diameter of the circle
r is the radius of the circle or d/2

It is readily seen that the variable term in the area formula is r or d, therefore the area will vary as the square of r or d. For example, if the original diameter of the pile at the decay line is 12 in and the depth of the decay averages 1 in, the remaining diameter would be 10 in. The areas would then vary as the square of 12 (or 144) to the square of 10 (or 100). The remaining sound area is approximately 70 per cent of the original area. In other words a loss of 30 per cent has taken place.

A rule of thumb for an inspector or a bridge foreman to follow in such types of decayed piles is to remove or reinforce the piles before they reach the 50-per cent point. Applying the area formula will give the following permissible depths of penetration for various pile diameters at ground or decay line:

Original diameter of pile at decay line	Depths of decay	Diameter of sound pile remaining
12 in.	1¾ in.	8½ in.
11 in.	1⅝ in.	7¾ in.
10 in.	1½ in.	7 in.
9 in.	1 5/16 in.	6⅜ in.
8 in.	1¼ in.	5½ in.

The Research Center of the AAR is studying the feasibility of detecting decay in timbers and piles by a technique known as gamma-ray backscatter. With this technique, gamma or other rays are bounced from the interior of the timber or pile back to a radiation-counting device. Sound wood will bounce more rays back to the counter than decayed wood and the investigation is to determine the relation between the radiation count of sound wood and that of decayed wood. If this technique is successful, inspec-

MOBILE... and FLEXIBLE... to cut your M/W costs

A LeTourneau-Westinghouse Adams† model grader, illustrated above, can give you immediate dollar savings on much of your yard, road crossing, and right-of-way maintenance and construction work.

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An L-W grader is not tied to tracks or highways. It is self-transporting, so you don't waste time waiting for work train or truck-and-trailer hauler. Grader travels at speeds to 27.4 mph... over roads, along your right-of-way, or cross-country.

Does many jobs well

This speedy one-man work-crew handles a wide variety of maintenance-of-way jobs. It is equally efficient working alone or in a gang. With regular blade, your modern L-W grader cuts ditches, builds or widens embankments, slopes banks, spreads fill, cleans-up yards and off-track areas, surfaces roads, and handles other grading and blade-work.

L-W grader with optional scarifier rips-up tough dirt, rocky soil, asphalt at crossings, etc. Equipped with optional dozer blade, this machine can also handle minor bulldozing, backfilling, dirtmoving, land clearing, etc. And a V-type snow plow and wing are available for snow removal in winter.

Saves costly hand labor

One man, on an L-W grader, does the work of many pick-and-shovel laborers. Your grader completes more work per hour... travels faster and farther, to handle extra projects in a day... substantially cuts your M/W costs.

6 LW Models... a size to fit your need

85 hp... 115 hp... 123 hp... 143 hp*... 160 hp... 190 hp*. Check how these LW graders fit your needs. You may want smaller-size machines for assignments to certain Sections... one or more medium-size graders to use within a Division... and big 190-hp LW machines to handle heaviest work, anywhere along your line. Write for complete information.

*with torque converter †Trademark G-1916-RR-2/3

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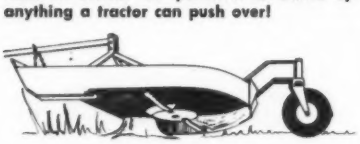
The Covington Cutter is engineered for heavy industrial work and not only out-performs but outlasts ordinary cutters. Massive, all-welded construction, an exclusive shielded flywheel and safety clutch are features that enable a Covington to take the toughest work in stride. So powerful it chews up anything a tractor can push over!



Rides over stumps and rocks without damage or slow-down!

. . . the heavy flywheel conveys unmatched power to serrated cutting blades and is shielded to slide easily over obstacles.

For tractors and Jeeps with 3-point lift.

The savings on repairs and man-hours will quickly pay for a Covington! A quality product of the manufacturer of famous Covington Planters since 1912.

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DOTHAN, ALABAMA

tion for decay in piling can be carried out without the destructive effects of the increment borer; less time will be required; and more accurate determination of sound areas will be possible.

Many other factors must be taken into account by the inspector or bridge foreman when he decides what action to take when he finds a pile to be decayed. Where the piles are treated and are classified as first-class piles, the amount of sapwood should be not less than one inch in depth. If piles are untreated the amount of sapwood should not exceed one inch in depth. Heartwood of most species of wood is more resistant to decay than sapwood. These observations will signal the inspector what deductions he should make from his depth readings. Other factors are:

(1) The alinement, that is, whether track is curved or tangent; and the speed of trains. Density of traffic is also important.

(2) Heights of bents, unsupported length of piles, and penetration of piles to sound ground.

(3) Settlement of piles under caps, or presence of any churning of piling.

(4) Number and kinds of piles in bents and the presence of any stubbed or spliced members, especially if the trestle is more than 15 ft in height.

(5) The presence and condition of sway, sash, or tower bracing, girts or struts.

(6) The fastening devices.

(7) Action under traffic.

How to post piles

In high-speed territory with heavy traffic, not more than two posted piles in a five or six-pile bent should be permitted. When posting a pile it should be uncovered a sufficient depth below ground level to reach sound wood. The decayed portion of the pile should be removed, that is, the entire part of pile cut out, and a post inserted in its place, toe nailing it securely. In addition, the post should be boxed to the pile and bolted securely to prevent buckling of the repaired pile.

No posting should be done on outside or batter piles where the trestle is on a curved track and the piles exceed 12 ft in height or on a tangent where the height exceeds 20 ft. The heights stated are measured from ground line to bottom of rail at the location of the bent in question.

If more than two piles are poor in a bent, all the piles should be cut off to the depth described and a framed bent

MARKED FOR REPLACEMENT

BUT IT COULD HAVE BEEN SAVED

. . . with OSMOSE

INSPECTION and TREATMENT

Whenever wood meets wood, or is in contact with ballast, ties, fastenings, stringers, etc. it offers an open invitation to fungus decay. Advanced infection at these critical areas can mean costly replacement of an entire bent which might contain 95% of perfectly sound wood.

Osmose Inspection and Treatment is the one sure, field-tested method to keep wood bridges and trestles in A-1 operating condition. Techniques perfected in treating over 5,000,000 power and communication poles in the past 20 years are applied by experienced crews who know wood from the inside-out. The Osmose Hollow-Heart Treatment, 24-12 Fire Retardant Treatment, Tri-way Ant and Termite Control Treatment are unique, low-cost proven methods to keep your timbers as good as new.

Actual case histories prove that OSMOSE in-place treatment runs between 2½ to 5% of the cost of replacement . . . pays for itself in the first 8 months of extended life. Why not let OSMOSE give you a quotation? No obligation to find out how you can enjoy these important savings, too. Write: Bridge Inspection and Treating Division, Osmose Wood Preserving Co. of America, Inc., 989 Ellicott St., Buffalo 9, N.Y.

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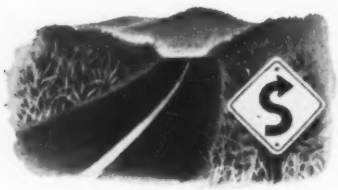
Line?



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WEEDONE can solve it!

With the right background—Chemical control of weeds and brush has developed along established lines of procedures and practices. Amchem initially pioneered the major advances in the field, has originated many of today's accepted procedures and products for efficient, economical weed and brush control. Your problems are in *experienced* hands when you hand them to Amchem!

With the right approach—Amchem's corps of weed and brush specialists are basically application specialists. Combining comprehensive theoretical and practical experience they are able to offer all industry a realistic approach to *any* weed or brush problem. These specialists have developed a variety of efficient weed and brush eradication programs over thousands of miles of line, roadside and right-of-way areas once-choked and inoperable due to infestation.

With the right product—Amchem's tremendously diversified product line is your assurance that the right weed and brush killer is available and will be utilized for your specific problem. Weedone Brush Killers, for example, have been used in the field for years and proven eminently successful in eliminating weeds and brush wherever they are a problem. Why not bring your problems to Amchem?

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What's the answer? (cont'd)

installed. The answer to the question about the proportion of bents in a bridge that can be framed due to decayed piling before redriving of the piles is recommended will depend on economics. Framed bents supported on sound piling will carry as much load as pile bents if the sills are properly anchored to the piles and the bents braced and strutted in the manner recommended for framed trestles. Examples of these are found in the AREA Manual in Chapter 7. The cost of this construction versus the expense of pulling and redriving piles will determine which procedure should be recommended.

Can 50-mile sections be justified?

On roads where section gangs are responsible for track maintenance and highways are not convenient for truck use, can sections 50 miles or more in length be justified economically without lowering track standards? If so, can such an organization adequately cope with severe rain, wind and snow storms? If not, what is the best solution? Explain.

For branch lines

By T. A. PRATA
Roadmaster
Chicago, Milwaukee, St. Paul & Pacific
Avery, Ida.

First of all, lots of time would be lost in traveling to and from work by rail from one headquarters. However, I think that could be worked out by organizing a good sizable crew of 12 or 15 men, and housing the men in camp cars or highway trailers. A good foreman could move the camp from one station to another as the work progresses within the 50-mile area. The track should be patrolled daily for inspection purposes and making minor repairs.

However, during the winter months at locations where we have snow, ice, rocks, high water and similar condi-

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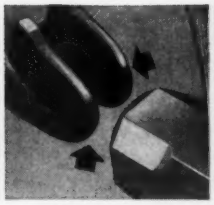
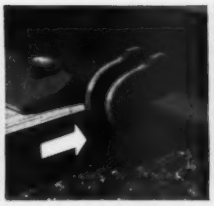
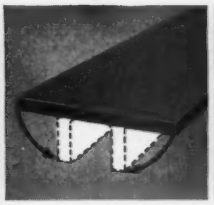
"U" channel provides rugged double-flange support for greatest gripping power, from end to end.



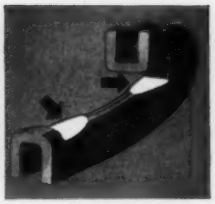
Double flange for wide striking surface. Channeloc is easy to apply with sledge, maul or machine—no skewing.



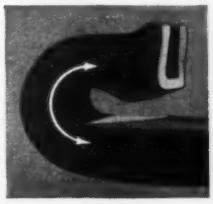
Channeloc is 100% tie-bearing with generous contact surface. Won't disturb tie plates, as it doesn't touch them.



Thorough and even heat-treating of every Channeloc is assured by uniform thickness of bar stock.



Rail contact surface is accurately formed and ample . . . keeps the Channeloc holding tight for a long, long time.



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tions, the crew would have to work where needed.

It is my belief that 50-mile sections would be more suitable for branch lines than for main lines. I would not recommend this for the main line in mountain territory.

With portable headquarters

By N. OLSEN
District Engineer
Pennsylvania
Pittsburgh, Pa.

To discuss this question it is necessary to make specific assumptions not covered in the question. First I assume it is meant, in referring to section gangs, that these gangs have fixed headquarters to which they must report at starting and quitting times. Further, I assume these gangs actually perform the majority of track work on their sections as opposed to being an inspection force which only performs limited emergency work. The inconvenience of highways for track use would indicate these gangs must travel by rail, i.e., track car or rail-highway truck. It is also assumed that the headquarters is located somewhere near the center of the 50-mile section.

These section gangs would then be required to travel an average of 25 miles per day by track car which would probably require two hours considering time setting car on and off the track and handling tools and material. Delays account of train interference would add to the non-productive time. It would thus appear that the loss of over 25 per cent of the productive day in travel alone would make this arrangement economically impractical.

As to the ability of these gangs to cope with severe rain, wind and snow storms, their limitations on that type of railroad would be no greater than the same number of men in any other type organization with the exception of rest and food facilities during emergencies of long duration.

It would thus appear that the maintenance of this type of railroad by section gangs can best be accomplished by use of camp cars or trailers. This would cut down the riding time and increase working time. An adequate patrol is necessary to the extended section-gang maintenance organization. This patrol can be performed better with a rail-highway vehicle so that the return to headquarters can be made both by highway or rail. Also, on days not patroling, help can be transported from the section gang to make small repairs.

I heartily recommend the 50-mile section limit with portable headquarters and adequate patrol. It would result in a larger specialized gang and, taking advantage of greater mechanization and labor productivity through mobility and size, create lower unit costs for maintenance work.

Would lower production

By J. GERYLO
Section Foreman
Canadian National
Crerar, Ont.

In this part of Northern Ontario, or any other province or state where severe weather conditions prevail due to snow storms and below zero temperatures, a considerable amount of "shimming" has to be done by the section forces to keep the track maintained for train speeds specified in the timetable. Because of this, I would oppose, if I had anything to say in the matter, having track sections 50 miles in length.

On sections of track where track motor cars are the only means of transportation for section forces and where the cars are operated only by "line ups," the delays due to trains, snow and time spent traveling would require a considerable number of man-hours. This would lower the productivity of the section gang, and no doubt overtime would be involved now and again due to train delays when returning to headquarters.

Since I am only referring to single main track, we have to take into consideration the passing tracks or sidings where main-line switches are concerned. In centralized-traffic-control territory, it is that much more important to have power and spring switches cleared of snow and ice and maintained in good order.

Rough track, due to heaving in below-zero temperatures, lowers track standards considerably. Also, any depressions or "off-surface" spots in

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...built to take a beating on construction jobs, in mines, on the farm, railroad crews, on service trucks ...wherever men work and the going is rough.

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It's got more production potential . . . more versatility. A new integral hydraulic system with under-the-hood mounting of tank, pump and valves frees the front and rear of the tractor for other equipment. Hydraulic bulldozers for the D6 have been improved with a new center-pivoted cylinder mounting to increase blade lift/drop range. Straight and angling bulldozers, rock rakes, winches, special clearing blades, back rippers equip the D6B for almost any maintenance, construction or emergency job.

You get economical operation. The famous Cat fuel injection pumps are in new easy-to-service housings. Precombustion chambers condition incoming fuel for controlled complete burning—help deliver maximum horsepower from heavy, economy-type fuels.

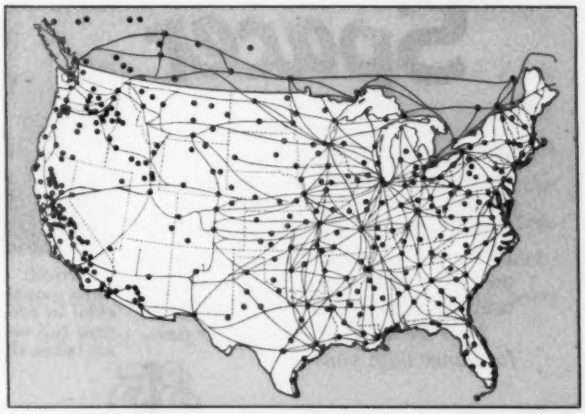
Maintenance costs are kept to a minimum. Caterpillar dependability and efficiency pay off in lower cost per hour operation. A dry-type air cleaner removes 99.8% of all dirt from diesel intake air. Serviced in five minutes, it cuts maintenance time by as much as 75%, eliminates oil costs. Optional hydraulic track adjusters require only a grease gun to make proper track adjustment. Lifetime lubricated track rollers never need lubrication or greasing. The exclusive Caterpillar oil clutch provides up to 2,000 hours of service without adjustment. All of these features help you roll up more availability instead of repair bills.

The D6 works almost anywhere. It's compact enough to work in tight places. It's got power to tackle the tough jobs. You can move it from job to job in a hurry.

No parts inventory needed . . . with the D6 or any other piece of Cat-built equipment. A nationwide Cat Dealer organization maintains more than 300 stores throughout the U. S. You don't have to tie up capital in a space-robbing parts inventory. Parts are as close as the telephone.

Your Caterpillar Dealer will welcome the chance to show you what the new D6 can do on your job. He'll give you the complete facts on the long-term economy and availability that are built into the new D6B.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.



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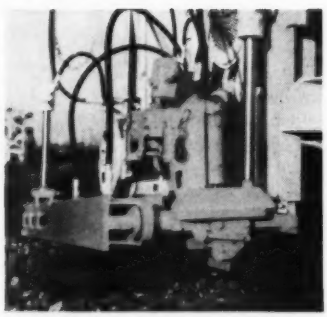
Under All Track Conditions

RMC Tie Spacer

The railroad industry's most thoroughly-proven tie spacer, this machine corrects poor spacing and slewed tie conditions by moving ties in either direction parallel to the rail. Hydraulic shifting devices on both sides of machine may be used independently or together.

May we discuss Tie Spacer performance with you?



Improved clamping device provides positive grip of the rail—even in presence of grease or severe rail wear. All spacing forces are taken through this anchorage.

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Railway Maintenance Corporation

BOX 1888 PITTSBURGH 30, PA.

What's the answer? (cont'd)

track having frozen ballast are felt more severely on running equipment. Ordinarily, when the ground is not frozen, most of the depression shocks are largely absorbed, both by the running equipment and the track. Section forces, which do not have such long sections, can repair these defects.

It should be remembered that the effects of rough track play a leading role in shortening the life of running equipment and track in general and result in more maintenance expense. Further, when assistant roadmasters or supervisors are patroling track and find a defect in need of immediate repairs, such as a broken rail or track that is "off surface" or "out of line," they may have to travel a considerable distance before contacting the section gang. Also, if trains obstruct the movement of the section gang, it would take some time before the crew could reach the defective point. The expense of the time involved in delays and traveling could well keep additional section men on the payroll on shorter track sections of no more than 15 miles, thereby keeping the track properly maintained.

There are many other factors ininvolved but I have mentioned only the ones which I consider outstanding, insofar as winter months are concerned.

Economically unsound

By H. STEELE
General Roadmaster
Ontario Northland
North Bay, Ont.

Where section gangs are responsible for complete track maintenance and where a high standard of maintenance is required, it is economically unsound to have sections 50 miles in length, regardless of whether highways are convenient or not.

Assume that a section gang's headquarters is located at one end of a 50-mile section and that a motor car is used for transportation. When work is required at the other end, the time consumed for traveling, figuring a speed of 25 mph, would be 4 hr, or half the working day. This might increase due to meeting or waiting for trains. The time consumed in traveling would, of course, be reduced as the gang worked towards its headquarters.

(Please turn the page)

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the ONLY Cost of Installation is TWO Man Hours

Why Pay 200% More for . . .

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Extra Rail	Needed	NONE
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Unmatched Quality and Performance

The exclusive shoe castings on Western Bumping Posts clamp around the rails, performing a shock-absorbing function. When struck a severe blow, they slide or "roll with the punch" . . . only a few inches . . . dissipating the remaining force that usually breaks ordinary posts. More effective. Fewer parts to replace. Two men . . . one wrench. No other tools are needed because there are neither holes to drill nor other work to be done.

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NOW... Plow, Remove Worn Ties, Sled Ballast and Align a MILE of Track a Day with MANNIX AUTO-TRACK

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Aligning unit at rear of MANNIX AUTO-TRACK keeps track in rough alignment behind plow, accurate alignment behind sled.

Sled replaces plow to place ballast under ties. This track was raised five inches.

MANNIX AUTO-TRACK eliminates 15 to 20 men, finishes a mile or more of track per day. For details or showing of operating films write, wire or phone TODAY. No obligation.

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What's the answer? (cont'd)

In sections of the country where snowfall is heavy and the highway crossings and switches that must be kept clear are situated at various points along the 50-mile stretch, it would be impossible to get around by track motor car for maintaining the switches and crossings at a high standard.

A solution, which I believe worth considering, would be to house these gangs in boarding cars that could be moved to different locations on the territory as required at short notice. This, of course, would entail setting up boarding facilities for feeding the crew when away from headquarters. This would result in some added cost, but, in my opinion, it would more than offset the reduced loss of working time.

Biographical briefs (cont'd)

(Continued from page 10)

instrumentman, also at Springfield, in 1935. He was promoted to roadmaster at Kansas City, Mo., in 1938, serving also in that capacity at Amory, Miss.; and division engineer at Ft. Scott, Kan., in 1942. From September 1944 to March 1946 he served with the United States Army. He returned to his former position at Ft. Scott in the latter year. Mr. Woldridge was promoted to assistant superintendent at Joplin, Mo., in 1947. He was appointed division engineer at Tulsa, Okla., the following year and process engineer at Springfield in 1955, the position he held at the time of his recent promotion.

Lloyd E. Hobbs, 32, who was recently promoted to assistant process engineer of the St. Louis-San Francisco at Springfield, Mo. (*RT&S*, Feb., p. 10), was born at Chicago and received his higher education at Tri-State College. He entered the service of the Frisco in 1951 as a rodman, being promoted to instrumentman the following year. He was further promoted to student apprentice in 1953 and assistant roadmaster in 1955. Mr. Hobbs was advanced to roadmaster two years later, the position he held at the time of his recent promotion.

Louis N. Riggan, 70, who recently retired as engineer of construction of the Seaboard at Richmond, Va. (*RT&S*, Dec., p. 10), was born at Wake Forest, N. C., and graduated from North Carolina State College in 1912 with the degree of Bachelor of Engineering. Mr. Riggan commenced his railroad career in 1913 on the Seaboard as a draftsman in the bridge and building department at Portsmouth, Va., also serving in this capacity in the valuation department at Norfolk, Va. He subsequently was promoted to instrumentman at Jacksonville, Fla., in 1916; chief clerk to chief engineer at Norfolk in 1918; chief

Grinding operation at one of Matisa's fixed location rail welding plants.

now . . . HIGHEST QUALITY welded rail, WHEN you want it, WHERE you want it— . . . and YOU SAVE MONEY!

Welded rail means decreased maintenance cost—and Matisa *Flash Thoroweld* rail from Matisa's fixed location plant means lower initial cost, too!

No men or duties are added to the M/W department. 36 miles of this rail was recently laid by the Rock Island between Logan and Tucumcari, New Mexico. Quarter-mile lengths of rail were welded from 39-foot lengths and delivered on the line from Matisa's fixed location plant. The Rock Island put down 2½ miles in an 8-hour shift!

This takes welding equipment off your right-of-way, puts welded rail *on the market*—you don't weld it, you *buy* it!

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AVAILABLE EVERYWHERE

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Biographical briefs (cont'd)

clerk, budget committee, also at Norfolk, in 1922; and assistant chief clerk to vice president and general manager in 1924. Mr. Riggan was further promoted to assistant engineer at Savannah, Ga., two years later, serving also in that capacity at Norfolk. He was advanced to engineer of construction at Norfolk in 1941, later being transferred to Richmond.

Carmine R. Procassini, 25, who was recently promoted to assistant division engineer on the Baltimore & Ohio at Tompkinsville, Staten Island, N. Y. (*RT&S,* Nov., p. 10), was born at Newark, N. J., and received his higher education at the Newark College of Engineering. He entered the service of the B&O in 1956 as an assistant in the engineering corps at Baltimore. Two years later he was promoted to field engineer there, serving also in that capacity at New York, the position he held at the time of his recent promotion.

William H. Beals, 39, who was recently promoted to assistant division engineer on the Chicago, Rock Island & Pacific at El Reno, Okla. (*RT&S,* Oct., p. 10), was born at Rock Island, Ill. He entered the service of the CRI&P in January 1946 as a rodman, being appointed draftsman at Chicago the following month. In 1956 he was promoted to resident engineer at Oklahoma City, Okla., also serving in that capacity at Dallas, Tex., and Amarillo. Mr. Beals was serving as assistant construction engineer at Chicago at the time of his recent promotion.

William H. Barber, 35, who was recently promoted to assistant division engineer on the Louisville & Nashville at Mobile, Ala. (*RT&S,* Jan., p. 10), was born at Belgreen, Ala., and received his higher education at Auburn University. He entered the service of the L&N in 1948 as a junior instrumentman, being promoted to senior instrumentman at Birmingham, Ala., two years later. He was appointed draftsman at Louisville, Ky., in 1951 and assistant engineer at Birmingham in 1956. He was serving in that capacity at Louisville at the time of his recent promotion.

George W. Varnum, 70, who recently retired as office engineer on the Santa Fe at Los Angeles, Cal. (*RT&S,* Jan., p. 10), was born at Montgomery City, Mo., and graduated from Iowa State College in 1919 with a Bachelor of Science degree in civil engineering. Mr. Varnum commenced his railroad career in 1910 as a chainman on the Santa Fe at San Bernardino, Cal. He was promoted to rodman there two years later. From 1917 to 1919 he served in the United States Army Engineers. Returning to the Santa Fe in 1919 he was appointed draftsman at Winslow, Ariz. He was appointed assistant engineer at Los Angeles, Cal., in 1922; assistant division engineer at Needles, Cal., in 1929; roadmaster at Kingman, Ariz., in January 1936; and assistant division engineer at San Francisco, Cal., in September of that year. Mr. Varnum was appointed office engineer at Los Angeles in 1937.

LaFayette S. Marriott, 65, who was recently promoted to assistant to engineer of buildings of the Illinois Central at Chicago (*RT&S,* Feb., p. 10), was born at Elizabethtown, Ky., and received his higher education at the University of Kentucky. He entered the service of the IC in 1915, working on maintenance and railroad construction at various locations. From February 1918 to July 1919 he was with the U.S. Army, serving in France. Returning to the IC in the latter year he worked on railroad construction at Dawson Springs, Ky. Mr. Marriott was promoted to draftsman and building inspector at Chicago in 1920 and assistant engineer at Freeport, Ill., in 1923, serving also in that capacity at Bluford, Ill., New Orleans, La., and Chicago. He worked on maintenance engineering at New Orleans and McComb, Miss., from July 1931 to July 1938, being appointed bridge and building supervisor at McComb in the latter month. In 1946 he was promoted to general building inspector, the position he held at the time of his recent promotion.

Association news

Mississippi Valley Maintenance of Way Club

The May meeting of the club will be held on the ninth at the Ambassador-Kingsway Hotel, 108 North Kingshighway, St. Louis, Mo. Principal speaker will be Harry H. Stuhldreher, assistant to vice president of personnel, United States Steel Corporation, and one of the "Four Horsemen of Notre Dame." He will talk on "Learn and Live."

Metropolitan Maintenance of Way Club

The annual stag outing of the club will be held on June 2 at the Wayne Country Club, Paterson-Hamburg Turnpike, Preakness, N. J. Activities are scheduled to commence at 10:00 am

(More on page 74)

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1953 Model Matisa Production Tamper with jack carriage and platforms, set off, repair parts, forty-eight tamping tools, all in good repair. Suitable for production or spot surfacing. Original cost $51,536. Can be equipped with front jacking arrangement. Price $8,000. fob line. Inspection solicited. Write Chief Engr. Clinchfield RR. Erwin, Tenn. Terms or monthly purchase plan available.

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WELDING SUPERVISOR, thoroughly experienced in flash-butt welding of railroad rail. Overseas location. Salary high, 18 months contract. Give detailed experience with references. Box 30. RAILWAY TRACK & STRUCTURES, 30 Church Street, New York 7, N. Y.

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Lush grass is both cut and mulched. This speeds decomposition to prevent interference with later mowings.

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International® Danco mows all!

Thick stands of tall weeds or heavy brush melt away under the whirlwind attack of International Danco center-mounted rotary mowers. Fine turf is clipped clean. Side slopes other outfits can't safely touch are quickly mowed . . . center-mounted design lowers the tractor center of gravity, permits safe mowing on slopes as steep as 2 to 1. Exclusive non-wrap spindles keep wet or wiry growth from wrapping, to insure continuous, uninterrupted mowing. Level-lift control linkage automatically levels the mower with each change in cutting height, lets operator adjust cutting height on-the-go. Optional 10-speed Torque Amplifier drive for 66 and 94-inch units, gives operator the exact tractor speed he needs for most efficient operation. Because of their versatility, International Danco mowers reduce investment, simplify servicing and reduce overhead costs.

There's a full line of International Danco mowers for every maintenance requirement—ranging from low-cost, 42 or 60-inch units (ideal for maintaining station grounds and other confined areas), to rugged, 61 hp units cutting 94 inches wide. Write today for catalog. International Harvester Co., Dept. RTS-5, P.O. Box 333, Chicago 80, Ill.

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Association news (cont'd)

American Railway Engineering Association

Two standing committees have scheduled meetings to be held in May. These are as follows: Track, May 17-18, Piedmont Hotel, Atlanta, Ga., including an inspection trip to the Southern's new Inman yard; and Masonry, May 12-13, Shoreham Hotel, Washington, D. C.

The following meetings are scheduled to be held early in June: Wood Bridges and Trestles, June 9-10, Madison, Wis., including an inspection trip to the Forest Products Laboratories; Engineering and Valuation Records, June 9-10, Shoreham Hotel, Washington, D. C.; and Yards and Terminals, June 6-7, Continental Hotel, Kansas City, Mo.

Neal D. Howard, executive secretary of the association, has announced that the 1961 convention will be held at the Conrad Hilton Hotel, Chicago, on March 7-9.

NRAA exhibit to be held in new Exposition Center

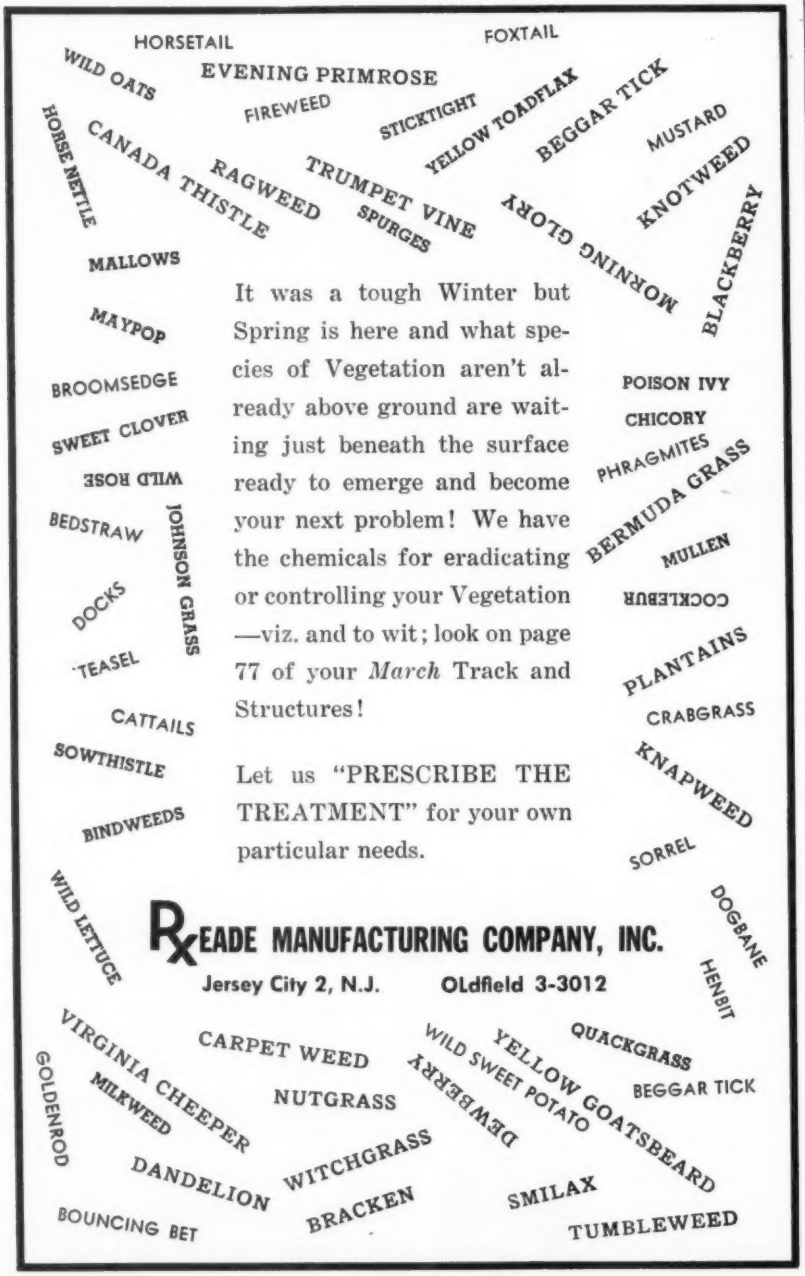
The exhibition that will be staged by the National Railway Appliances Association in conjunction with the annual convention of the American Railway Engineering Association in March 1961 will take place at the huge new Exposition Center now under construction on Chicago's lake front. A contract with the Metropolitan Fair & Exposition Authority covering space in the new center for the exhibition was signed on March 25, according to Kenneth Cavins, president of the NRAA. "This new location for our exhibit will offer modern facilities of all types and will provide a lot more space," declared Mr. Cavins.

Association of Track and Structure Suppliers

The new $34 million Exposition Center now being constructed on Chicago's lake front is being considered as the location of the next exhibition of this association. The exhibition is scheduled to be held in September 1962 in conjunction with the annual conventions of the Roadmasters' Association and the American Railway Bridge & Building Association.

Disclosure of this possible change in the location of the exhibition came following a meeting of the board of directors of the ATSS at Chicago on March 18. Other business transacted included action on membership applications and preliminary discussion of plans for the banquet the association will sponsor on September 18, 1960, at the Conrad Hilton Hotel, Chicago, for members of the Roadmasters' and B&B Associations and their families.

The ATSS board meeting was held under the direction of President L. E. Flinn. Following adjournment most members took part in an inspection of the offices of the Association's executive secretary in the Merchandise Mart. The offices were moved to the new location following the appointment of Samuel C. Johnson as executive secretary last December to succeed the late Lewis Thomas.



Supply trade news

AMERICAN HOIST & DERRICK—This company has acquired the Industrial Brownhoist Corporation, Bay City, Mich., according to an announcement by **John E. Carroll**, president of American Hoist. The announcement stated that Industrial Brownhoist will be operated as a wholly owned subsidiary of American Hoist with operations continuing at Bay City.

A. M. BYERS COMPANY—**Albert D. Sheere**, manager of the Pacific Coast Division at San Francisco, Cal., retired on March 31 after more than 36 years of service.

RAIL JOINT COMPANY — **L. D. Whitaker**, president of the **Ralph W. Payne Company**, Washington, D. C., has been appointed regional manager of the Rail Joint Company, a division of Poor & Company, succeeding **Ralph W. Payne** whose death was announced in the April issue.

VAN PRODUCTS COMPANY—This company has announced the appointment of the **Pilot Packing Company**, with offices both at New York and Chicago, as exclusive distributors for Van-Air dryers to the railroad industry.

AIR POWER that's RIGHT for RAILROADS

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From Ingersoll-Rand's *complete line* of portable air compressors you can select one that's just the right size and capacity for any air power job—whether it requires 36 cfm or 900 cfm, or anything in between!

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Every I-R portable compressor is designed and built to stay *on the job* year after year, with top-quality construction throughout for long, trouble-free service.

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I-R units can be as portable as you want—from the Spot-Air compressor that can be moved by one man, to 2-wheel or 4-wheel Gyro-Flo units that can be pulled by a utility truck or tractor. Rail mounted units are also available. Units can also be supplied without running gear for built-in applications in mechanized maintenance equipment.

✓ *in simplicity of operation*

Simple, centralized controls and automatic regulation make I-R compressors as easy to operate as an automobile engine. No special skills are required to get top performance and economy.

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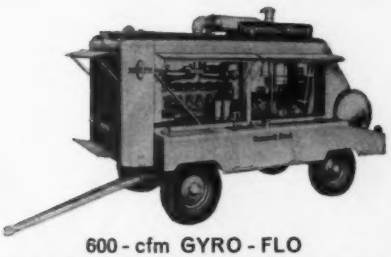
Gyro-Flo rotary compressors have no pistons, rings or valves to wear out or replace. Their simplicity of construction means minimum maintenance expense throughout years of operation.



600 - cfm GYRO - FLO

Four-wheel unit with diesel engine drive weighs only 9700 lb ready to run.

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Two-wheel unit with gasoline or diesel engine drive.

SPOT - AIR COMPRESSOR

36-cfm unit weighing only 265 lb is an ideal power supply for the section gang.

TIE TAMPERS & SPIKE DRIVERS

Replacing muscle power with air power saves time and money in track maintenance.

And there's a whole line of air-powered track and maintenance-of-way tools.

• In railroad construction and maintenance work, Ingersoll-Rand air compressors can save time, effort and expense all along the line. Ask your I-R engineer for complete information on the compressors and tools to meet your exact requirements for any job.

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Compact self-propelled unit ups output of four-man gang

It's a case of more work at lower cost when you use the Wisconsin-powered Fairmont W99 Spot Tamper. Light, compact, and easy to use, the W99 enables one man to perform all tamping operations — and leaves the other three free for jacking and sighting track, dressing, etc.

Time-saving drive and round-the-clock muscle are supplied by the workhorse BKND Wisconsin Engine. There's no need to tie up men and equipment for hauling the unit. The W99 Spot Tamper gets to and along the job route under its own Wisconsin power.

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Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

●

LINING SCOPE. The new Positive Tilt Control and fiber-glass carrying case for the Hayco Model HL Lining Scope are described and illustrated in a circular now available. Designated No. 117, the circular gives the pertinent details of each item and describes, with the aid of photographs, how the new control is quickly attached to the scope to enable the operator to hold the horizontal crosshair on a target. Also pictured and described is the mirror-reflector assembly, consisting of a rear-view mirror, demountable visor and red-amber reflector. (Write: *The Brice Hayes Company, Dept. RTS, 6710 Northwest Highway, Chicago 31)*

COMPRESSED AIR DRYERS. The Van line of compressed air dryers is described and illustrated in a 16-page booklet entitled "Moisture Control." The booklet explains the method used by the units to dry and clean compressed air and describes the materials used. Features of the dryers are described and the advantages of using them listed. The booklet includes data and specifications for various models of dryers and dryer-receivers and information for choosing and installing the units. (Write: *Van Products Company, Dept. RTS, Erie, Pa.)*

PROTECTIVE COATINGS. The complete line of Allied Chemical coal-tar protective coatings is described in a new 13-page booklet. Designated CAC-11-958, the booklet includes detailed specifications, packaging information, a list of general properties and the resistance of the coatings to various corrosive conditions and materials. Typical uses for each cold-applied protective coating are given. Tables give the wet and dry film thicknesses of each coating. (Write: *Allied Chemical Corporation, Plastics and Coal Chemicals Division, Dept. RTS, 40 Rector St., New York 6)*

CONSTRUCTION EQUIPMENT. The complete line of the manufacturer's earthmoving equipment and diesel engines is described in a new booklet. Designated Form D942, the 20-page, 2-color booklet is entitled "Caterpillar Construction Equipment." It contains pictures and brief specifications of the machines, including motor graders, crawler and wheel tractors, bulldozers, rippers, Traxcavators, crawler-drawn scrapers, wheel scrapers and wagons, pipelayers, industrial and marine engines and electric sets. Auxiliary equipment available is also shown. (Write: *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.*)

BRUSH CUTTERS. Two models of Covington cutters are described and illustrated in a new four-page loose-leaf folder. Specifications are given for the Model R, lift type, and Model RD, pull type. The features of the units are listed in the folder and the mechanical elements are described. Photographs show the cutters in operation. (Write: *W. F. Covington Planter Company, Inc., Dept. RTS, Dothan, Ala.)*

PRESSURE-TREATED WOOD. A new 12-page pocket guide is available which describes the various applications of pressure-treated wood on the railroads. Products mentioned include crossties, switch ties, panel grade crossings, cribbing, poles for pole-type buildings, fence posts, piling, timbers, lumber and decking. The illustrated booklet also describes Krinkle-Lok anti-checking irons, Wolmanized lumber and Non-Com fire-protected lumber. (Write: *Koppers Company, Inc., Wood Preserving Division, Dept. RTS, 750 Koppers Building, Pittsburgh 19, Pa.)*

CRAWLER TRACTOR. The TD-25, largest and most powerful International Harvester crawler tractor, is described in a new 24-page catalog. The three-color catalog, CR-791-I, is profusely illustrated with photographs and cutaway diagrams showing the features of the machine. The operating and mechanical functions of the TD-25 are described, including 230-hp engine, planet-power steering, Dura-Rollers, lubrication oil cooler, dry-type air cleaner and push-button electrical starting. (Write: *International Harvester Company, Dept. RTS, 180 No. Michigan Ave., Chicago 1.)*

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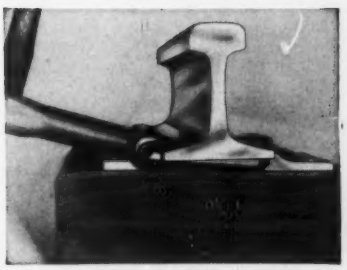

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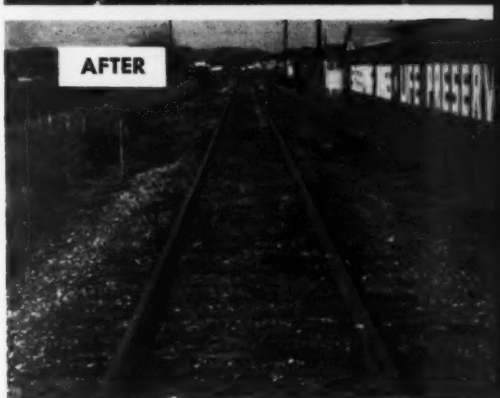

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